

Draft Environmental Impact Statement and Land-Use Plan Amendments for the Energy Gateway South Transmission Project

BLM/WY/PL-14/009+5001

Case File: WYW-174597



Wyoming State Office

February 2014

Volume I-B
Chapter 4 through Appendices





U.S. Department of the Interior Bureau of Land Management

Draft Environmental Impact Statement and Land-use Plan Amendments for the Energy Gateway South Transmission Project

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Cheyenne, Wyoming 82009

Cooperating Agencies

U.S. Forest Service – Intermountain Region
U.S. Army Corps of Engineers – South Pacific Division
U.S. Army Environmental Center
U.S. Department of Defense – Navy Region Southwest
Bureau of Indian Affairs – Western Region
U.S. Fish and Wildlife Service – Mountain-Prairie Region
National Park Service
Utah Reclamation Mitigation and Conservation Commission
State of Wyoming
State of Colorado
State of Utah
Carbon and Sweetwater counties, Wyoming
Mesa, Moffat, and Rio Blanco counties, Colorado
Carbon, Duchesne, Emery, Grand, Juab, Sanpete, Uintah, and Wasatch counties, Utah
Wyoming Conservation Districts (Little Snake River, Medicine Bow, Saratoga-
Encampment-Rawlins, Sweetwater County)

February 2014

BLM Mission

To sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

CHAPTER 4 – CUMULATIVE EFFECTS

4.1 Introduction

This section presents the cumulative effects associated with the Project, including (1) a general definition of cumulative effects, (2) elements that were considered in the cumulative effects analysis, (3) the assessment approach, and (4) the results of the assessment of cumulative effects for the Project.

4.1.1 Definition

Cumulative impact, as defined by the CEQ (40 CFR 1508.7), is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (RFFAs), regardless of what agency (federal or non-federal) or person undertakes other such actions. Cumulative impacts could result from individually minor, but collectively significant actions taking place over a period of time. The purpose of the cumulative effects analysis is to ensure that the decision-makers consider the full range of consequences of a Proposed Action and Alternatives, including the No Action Alternative.

The CEQ has defined the resulting effects of a Proposed Action and its alternatives as direct and indirect. Direct effects are caused by the Project Action and occur at the same time and place. Indirect effects also are caused by the Project Action, but are later in time or further removed in distance, yet are still reasonably foreseeable (40 CFR 1508.8). Cumulative effects, discussed in this chapter, are the total effects on a given resource or ecosystem of all actions taken or proposed.

4.1.2 Elements Considered in Cumulative Effects Analysis

The cumulative effects assessment process considered (1) scoping and Project issues; (2) cumulative effect timeframes and the resources (or receptors) that could be affected by the Proposed Action and Alternatives; (3) the geographical area in which the impacts would occur; and (4) other past, present, and RFFAs that have, or could be expected to cause, impacts on these resources when considered with development of the Project.

4.1.2.1 Cumulative Effects Issues

The identification of issues for analysis in the EIS is discussed in Section 1.6.2. Those issues determined to potentially involve a cumulative effect with other past, present, or RFFAs are included in the cumulative effects analysis. An exception is if the Proposed Action or Alternatives would have no direct or indirect effects on a resource, it would not contribute incrementally to cumulative effects and is not included in the analysis for that resource.

4.1.2.2 Geographic and Temporal Scope

The geographic scope is the spatial extent where cumulative effects may occur on a resource. The geographic scope is assessed, and will often be different, for each cumulative effects issue. It is generally based on the natural boundaries of the resource affected. In several cases, the geographic scope for a resource is substantially larger than the corresponding alternative route study corridors for Project-related effects to consider an area large enough to encompass likely effects from other projects on the same resource.

The temporal scope is established by the timeframe for a cumulative effects issue—that is, the duration of short-term and long-term effects anticipated. Together, the geographic and temporal scopes make up the cumulative impact analysis area (CIAA).

4.1.2.3 Cumulative Actions

In general, a cumulative action is a past, present, other proposed action, or RFFA that potentially has a cumulatively significant impact when combined with the Proposed Action. For purposes of this analysis, RFFAs are proposed projects or actions that have either applied for a permit from local, state, or federal authorities or which are publicly known. Tables 4-1 and 4-2 list known current and future projects and RFFAs located in or near the Project area. Past, present, and RFFAs also are shown in MV-25 and MV-26. The projects listed in Tables 4-1 and 4-2 were incorporated into the analysis for the Project.

4.2 Cumulative Assessment Approach

The elements considered in the cumulative effects assessment, (1) cumulative effects issues, (2) geographic and temporal scopes defined for analysis, and (3) method(s) of quantitative and/or qualitative analysis are described by resource in Table 4-3. In general, quantitative analyses were performed for issues where the relevant data were available for the CIAA. For purposes of this assessment, quantitative estimates of cumulative effects on resource are based on the estimated spatial extent of development for the proposed Project and each past, present, and other RFFAs. The specific methods used in these estimations are discussed in this section.

The quantitative assessment of cumulative effects was performed using a seven-step process:

1. **Compile Resource Inventory for the CIAA.** The available resource within a CIAA was compiled by overlaying a polygon representing the CIAA identified for a resource issue over the relevant resource inventory data.
2. **Estimate Spatial Extent of Existing Development.** A single base layer of existing development was defined to include the existing land use inventory developed for the effects analysis (refer to Section 3.2.10.4.1); buffered transmission lines, pipelines, railroads, and roads within the 2-mile-wide alternative route study corridors; LANDFIRETM data and buffered transmission lines, pipelines, railroads, and roads outside of the 2-mile-wide alternative route study corridors; and data collected for past and present actions within the Project area boundary. Table 4-4 presents the data components used to compile the base layer for existing development.
3. **Estimate Spatial Extent of RFFA Development.** A single base layer of RFFA development was established based on the rationale or assumptions outlined in Table 4-2. For oil and gas development areas, the associated development for each area was estimated based on approved maximum disturbance levels and well pad spacing (i.e., the approved maximum disturbance was distributed equally within the area boundary using approved well pad spacing). The spatial extent of RFFA development was then compiled into a single base. The base layer was not developed to contain individual attribute information; rather, the base layer includes a summary of all attributes.
4. **Estimate Spatial Extent of Project Development.** The area was compiled depending on the CIAA. For some resource issues, the area was created by buffering each alternative route by a specified amount (i.e., 1 mile on either side of an alternative route). For other resource issues, alternative routes were intersected with the CIAA. For example, the CIAA for water resources is the 8-digit HUC (subbasin) drainage areas crossed by the alternative routes. Each alternative

route was intersected with the 8-digit HUC (subbasin) drainage areas to determine the spatial extent of Project development for each alternative route.

5. **Estimate Total Cumulative Development.** The layers were amalgamated to generate an estimated total cumulative development for each CIAA (i.e., the existing development data layer, the RFFA development layer, and the CIAA available resource inventory layer). In areas where existing development, RFFAs, and resource inventory all occurred, only the spatial extent of existing development and the CIAA available resource inventory were calculated (i.e., excluding RFFA development) to eliminate “double-counting” of development of an RFFA in areas already affected by past actions.
6. **Determine Incremental Project Development.** The spatial extent of the incremental Project effect on an available resource in the CIAA was determined by overlaying the existing and RFFA cumulative development layers with the estimated disturbance calculations generated from the Project description.
7. **Determine Remaining Available Resource.** The spatial extent of the remaining available resource (e.g., habitat) in the CIAA was determined by assessing the area outside of the estimated total cumulative development area.

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Multi-state Projects					
Northwest Colorado District Planning Unit					
Enterprise Mid-America Pipeline Western Expansion II Project	Pipeline	Crosses Baxter Pass in Colorado and turns west and proceeds along Interstate 70 to Thompson Springs, Utah	C196, C197, C270	96 miles (579 acres)	A 50-foot wide corridor was created by buffering the pipeline’s centerline according to the description of the permanent right-of-way in the Environmental Assessment (EA) released July 2012 (Bureau of Land Management [BLM] 2012q). The source for the Project alignment is the BLM Northwest Colorado District (BLM 2012r).
Geospatial – Multi-agency Coordinating Group					
–	Historical fire	Throughout the Project area	C175, C177, C185, C186, C188, U432, U490, U600, U625, U631, U636, U637, U638, U639, U650	501,342 acres (501,342 acres)	The polygons (boundaries) for the historic fires from 2000 to 2012 were used in the analysis. These data were used to display historic fires because it is a consistent dataset for all three states. The source for these boundaries is the U.S. Forest Service (USFS 2011g, 2012h).
Wyoming					
Federal					
Bureau of Land Management Rawlins Field Office					
Anadarko Atlantic Rim Natural Gas Project	Oil and/or gas development	Carbon County, Wyoming, south of Interstate 80 (I-80), east of Wyoming Highway 789	W110, W111, W32	270,420 acres (8,446 acres)	The development assumptions for this project are 2.5 acres of disturbance per well pad and a density of 1 well pad per 80 acres. These assumptions are based on information in the Environmental Impact Statement (EIS) and Record of Decision for the Atlantic Rim Natural Gas Field Development Project (BLM 2007b). The source for the project boundary is the BLM Rawlins Field Office (BLM 2005f).
Arch of Wyoming, LLC Carbon Basin Mine	Coal mine	Located in Carbon County, Wyoming, north of I-80, east of Hanna, Wyoming	–	13,347 acres (13,347 acres)	The development assumption for this surface and underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the U.S. Geologic Survey (USGS 2011).
Kennecott Uranium Company Sweetwater Mine	Non-coal mine	23 miles north of Wamsutter, Wyoming	–	11,715 acres (11,715 acres)	The development assumption for this surface mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the BLM Rawlins Field Office (BLM 2001c).
PacifiCorp Dunlap I Wind Farm	Wind energy facility	Near Medicine Bow, Wyoming	–	16,279 acres (60 acres)	The development assumptions for this project are the turbine points that were digitized and given a size of 0.7 acres of disturbance per pad based on the 2012 National Agriculture Imagery Program (NAIP) aerial imagery of the structures as digitized by EPG (NAIP 2012).
PacifiCorp Seven Mile Hill Wind Energy Facility	Wind energy facility	42 miles northeast of Rawlins, Wyoming	W15, W16, W21	8,942 acres (57 acres)	The development assumptions for this project are the turbine points that were digitized and given a size of 0.7 acres of disturbance per pad based on 2012 NAIP aerial imagery of the structures as digitized by EPG (NAIP 2012).
Power Company of Wyoming Chokecherry and Sierra Madre Wind Farm	Wind energy facility	South of I-80 and Rawlins, Wyoming	W30	214,122 acres (592 acres)	The development assumptions for this project are 0.6 acres of disturbance per turbine and 1,000 wind turbines distributed evenly within the Project area boundaries (Chokecherry: 220-acre spacing; Sierra Madre: 218-acre spacing). The project boundary and assumption for the number of turbines is based on information in the Chokecherry and Sierra Madre Programmatic Plan of Development (BLM 2012s), and the density is based on the Chokecherry and Sierra Madre Programmatic Record of Decision (BLM 2012t) as digitized by EPG.
Terry Hankins Copper Mine	Non-coal mine	15 miles west and south of Grand Encampment, Wyoming	–	54 acres (54 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the BLM Rawlins Field Office (BLM 2001c).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
–	Vegetation management ⁴	Throughout the Rawlins Field Office	W32, W110, W300	156,840 acres (156,840 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of the vegetation management activities is unknown. The source for the project boundary is the BLM Rawlins Field Office (BLM 2010f).
Bureau of Land Management Rock Spring Field Office					
Ambre Energy Black Butte Mine	Coal mine	25 miles east of Rock Springs, Wyoming	–	42,413 acres (42,413 acres)	The development assumption for this surface mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the USGS (USGS 2011).
Chevron U.S.A., Inc. Table Rock Field Oil and Gas Development	Oil and/or gas development	40 miles east of Rock Springs, Wyoming	–	13,633 acres (849 acres)	The development assumptions for this project are 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Table Rock Field Oil and Gas Development Environmental Assessment and Finding of No Significant Impact (BLM 2012u). The source for the project boundary is the BLM Rock Springs Field Office (BLM 2012v)
Level III/Anadarko Leucite Hills Mine	Coal mine	Southwest of Jim Bridger Coal Mine, 6 miles southeast of Superior, Wyoming	–	6,721 acres (6,721 acres)	The development assumption for this surface mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the USGS (USGS 2011).
PacifiCorp Jim Bridger Mine	Coal mine	10 miles east of Superior, Wyoming	–	26,640 acres (26,640 acres)	The development assumption for this surface and underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the USGS (USGS 2011).
–	Vegetation management ⁴	Along the Wyoming border, between Manila, Utah and Hiawatha, Colorado	–	55,722 acres (55,722 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of vegetation management activities is unknown. The source for the project boundary is BLM Rock Springs Field Office (BLM 2010g).
State					
Wyoming Office of State Lands and Investments					
–	Coal mine	Within a 2-mile-wide study corridor for the Project	W121, W299	3,183 acres (3,183 acres)	The development assumption for these leases are to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the Wyoming Office of State Lands and Investments (as digitized by EPG), March 2013 (Wyoming Office of State Lands and Investments [OSLI] 2013b).
–	Non-coal mine	Within a 2-mile-wide study corridor for the Project	–	632 acres (632 acres)	The development assumption these uranium leases are to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the Wyoming OSLI (as digitized by EPG), March 2013 (Wyoming OSLI 2013b).
–	Oil and/or gas development	Within a 2-mile-wide study corridor for the Project	W102, W111, W116, W120, W121, W299, W32, W35	11,111 acres (827 acres)	The development assumptions for these leases are 3.1 acres of disturbance per well pad and a density of 1 well pad per 40 acres. The assumption for well pad density is based on information in Chapter 3; Section 8 of the Wyoming State Statutes for Oil and Gas Development, (State of Wyoming 2008) and for the well pad size, this information is based on the existing Atlantic Rim Oil and/or Gas Development Field in the Rawlins Field Office (BLM 2007b). The source for the project boundary is the Wyoming OSLI (Wyoming OSLI 2013c).

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Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Local					
Carbon County					
Cassidy River Ranch	Residential subdivision	In Medicine Bow, Wyoming	–	8,024 acres (8,024 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Wyoming 2012b).
PacifiCorp Standpipe Substation	Substation	2 miles southeast of Hanna, Wyoming	–	26 acres (26 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is Rocky Mountain Power (Rocky Mountain Power 2011).
Sweetwater County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Colorado					
Federal					
Bureau of Land Management Grand Junction Field Office					
–	Oil and/or gas development	Throughout the Grand Junction Field Office	C197	88,102 acres (697 acres)	The development assumptions for this project are 1.5 acres of disturbance per well pad and a density of 1 well pad per 160 acres. These assumptions are based on information in Reasonably Foreseeable Development Scenario for Oil and Gas Grand Junction Field Office (BLM 2012w). The source for the project boundary is the BLM Colorado State Office (BLM 2012x)
Bureau of Land Management Little Snake Field Office					
Tri-State Generation and Transmission Association, Salt River Project Agricultural Improvement and Power District, Platte River Power Authority, and PacifiCorp Trapper Mine	Coal mine	Southwest of Craig, Colorado; east of Colorado State Highway 13	–	10,569 acres (10,569 acres)	The development assumption for this surface mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the BLM Rawlins Field Office (BLM 2001c).
TriState/Western Fuels-Colorado, LLC ColoWyo Coal Mine	Coal mine	12 miles north of Meeker, Colorado	–	14,369 acres (14,369 acres)	The development assumption for this surface mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the BLM Rawlins Field Office (BLM 2001c).
WexPro Company Carl Allen #45	Oil and/or gas development	1.5 miles northeast of Powder Wash, Colorado	–	6 acres (6 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the development area is a minimal size. The source for the project boundary is WexPro Company (WexPro Company 2012).
–	Oil and/or gas development	Throughout the Little Snake Field Office	C106	314,599 acres (31,395 acres)	The development assumptions for this project are 4 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Little Snake Field Office Reasonable Foreseeable Development: Oil and Gas in the Little Snake Field Office (BLM 2004d). The source for the project boundary is the BLM Colorado State Office (BLM 2012x)
–	Vegetation management ⁴	Throughout the Little Snake Field Office	C91	18,480 acres (18,480 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of the vegetation management activities is unknown. The source for the project boundary is the BLM Little Snake Field Office (BLM 2011q).
Bureau of Land Management White River Field Office					
American Soda, LLP Sodium Mine	Non-coal mine	21 miles southwest of Meeker, Colorado	–	250 acres (250 acres)	The development assumption for the surface and underground mine is to use the entire project boundary since development at this point is unknown. The source for the project boundary is the BLM White River Field Office (BLM 2013e).

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Blue Mountain Energy, Inc. Deserado Mine	Coal mine	Near the Moffat-Rio Blanco county line	C177	8,154 acres (8,154 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area development at this point is unknown. The source for the project boundary is the BLM White River Field Office (BLM 2009g).
Blue Mountain Energy, Inc. Deserado Mine Expansion	Coal mine	Just south of Moffat-Rio Blanco county line	–	3,175 acres (3,175 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the BLM White River Field Office (BLM 2012y).
Chevron Shale Oil Company Oil Shale RDD	Oil shale and/or tar sands	19 miles northwest of Rio Blanco, Colorado	–	153 acres (153 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the BLM White River Field Office (BLM 2012z).
EGL Resources, Inc. Oil Shale RDD	Oil shale and/or tar sands	25 miles northwest of Rio Blanco, Colorado	–	155 acres (155 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the BLM White River Field Office (BLM 2012z).
Gravel Pits (Owner unknown)	Non-coal mine	Two pits – 6 miles southeast of Meeker, Colorado and 8 miles northeast of Rangely, Colorado	–	24 acres (24 acres)	The development assumption for this surface mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the BLM White River Field Office (BLM 2012aa).
Natural Soda, Sodium Mine	Non-coal mine	24 miles southwest of Meeker, Colorado	–	577 acres (577 acres)	The development assumption for the surface and underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the BLM White River Field Office (BLM 2013e).
Questar Gas Company, Greasewood Gas Plant Compressor Station	Oil and/or gas development	18 miles southwest of Meeker, Colorado	–	110 acres (110 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the BLM White River Field Office (BLM 2013f).
Shell Frontier O&G, Inc. Oil Shale RDD	Oil shale and/or tar sands	Three units – 18 miles southeast of Rangely, Colorado	–	475 acres (475 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the BLM White River Field Office (BLM 2012z).
–	Oil and/or gas development	Throughout the White River Field Office	C175, C195, C196	593,738 acres (56,586 acres)	The development assumptions for this project are 4 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the White River Draft Resource Management Plan/EIS for Oil and Gas Development (BLM 2012ab). The source for the project boundary is the BLM Colorado State Office (BLM 2012x).
–	Vegetation management ⁴	Throughout the White River Field Office	–	1,023 acres (1,023 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of vegetation management activities is unknown. The source for the project boundary is the BLM White River Field Office (BLM 2009h).
State					
Colorado State Lands Board					
–	Oil and/or gas development	Throughout the Colorado portion of the Project study area	C91, C101, C105, C100, C13, C61	131,500 acres (491 acres)	The development assumptions for this project are 3 acres of disturbance per well pad and a density of 1 well pad per 640 acres. In the Hiawatha area, the assumptions are 3 acres per well pad with a well pad density of 1 per 40 acres. These assumptions are based on information received from the Colorado State Land Board during a call on March 14, 2013 (Osborn 2013). The source for the project boundary is the Colorado State Land Board (Colorado State Land Board 2012).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Local					
Garfield County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Mesa County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Moffat County					
Wilderness Ranches	Residential subdivision	30 miles north and east of Craig, Colorado	–	14,318 acres (14,318 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is information received from Moffat County (Moffat County 2009b).
Rio Blanco County					
County Special Use Permit	Local development (industrial)	Located to the east of Rangely, Colorado near Colorado State Highway 139	–	15 acres (15 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is information received from Rio Blanco County (Rio Blanco County 2012).
Routt County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Utah					
Federal					
Bureau of Land Management Fillmore Field Office					
Central Utah Telephone Fiber Optic Line	Communication facility	Nephi to Fountain Green	U639, U650	14 miles (33 acres)	A 20-foot buffer was added to the fiber optic centerline based on information from the Fillmore Field Office (BLM 2013g). The source for the Project alignment is the BLM Fillmore Field Office (BLM 2013h).
Chevron Rangely to Salt Lake City Pipeline	Pipeline	Begins near Rangely, Colorado and terminates near Salt Lake City, Utah	U420, U430, U300	368 miles (4,461 acres)	This 10-inch-diameter pipeline was buffered to create a 100 foot corridor based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011a). The source for the Project alignment is POWER Engineers (Power 2012).
Eureka Analysis Area	Vegetation management ⁴	1 mile west of Eureka, Utah	–	7,767 acres (7,767 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of the vegetation management within the boundary is unknown. The source for the project boundary is the BLM Fillmore Field Office (BLM 2012ac).
Hannifin Analysis Area	Vegetation management ⁴	1 mile southwest of Eureka, Utah	–	1,238 acres (1,238 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of the vegetation management within the boundary is unknown. The source for the project boundary is the BLM Fillmore Field Office (BLM 2012ac).
Intermountain Power Agency (IPP) Intermountain Mona Lines No. 1 and 2	Transmission line	From IPP substation through Leamington Canyon to Adelanto, California	–	100 miles (1,818 acres)	These 345kV transmission centerlines were buffered to 150 feet based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011b). The source for the Project alignment is POWERmap Platts as digitized by EPG (Powermap Platts 2009).
Kern River Gas Transmission Company Pipeline	Pipeline	Begins 6 miles southeast of Evanston, Wyoming, and terminates in Bakersfield, California	–	432 miles (15,709 acres)	This 36- to 42-inch diameter pipeline was buffered to create a 300 foot corridor based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011a). The source for the Project alignment is POWER Engineers (PennWell Map Search 2011).
Magnum Gas Storage Pipeline	Pipeline	Begins 2 miles northwest of Elberta, Utah, and terminates 4 miles east of Sugarville, Utah	–	373 acres (373 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the boundary is meant to represent the pipeline right-of-way. The source for the project boundary is the BLM Fillmore Field Office (BLM 2010h).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
PacifiCorp Camp Williams to Sigurd No. 1	Transmission line	From Camp Williams, Utah County, Utah, to Sigurd Substation, Sevier County	–	0.3 miles (6 acres)	This 345kV transmission centerline was buffered to 150 feet based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011b). The source for the Project alignment is POWERmap Platts as digitized by EPG (Powermap Platts 2009).
PacifiCorp Camp Williams to Sigurd No. 2	Transmission line	From Camp Williams, Utah County, Utah, to Sigurd Substation, Sevier County	–	0.3 miles (6 acres)	This 345kV transmission centerline was buffered to 150 feet based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011b). The source for the Project alignment is POWERmap Platts as digitized by EPG (Powermap Platts 2009).
PacifiCorp Currant Creek Power Plant	Power generation	2 miles west of Mona, Utah	–	(165 acres) (165 acres)	The development assumption for this project is to consider the area within the project boundary as the development area. Development was digitized (by EPG) using 2011 NAIP aerial imagery (NAIP 2011c).
PacifiCorp Mona to Oquirrh Transmission Project	Transmission line	Begins at Clover Substation near Mona, Utah, and proceeds to the proposed Limber Substation site in Tooele County, Utah	–	114 miles (2700 acres)	The 500kV portion of the transmission centerline was buffered to 225 feet, and the 345kV portion was buffered to 150 feet based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011b). The source for the Project alignment is POWERmap Platts as digitized by EPG (Powermap Platts 2009).
Questar Currant Creek Lateral Pipeline	Pipeline	Extends north from the Currant Creek Power Plant west of Mona, Utah, to the end of Questar’s Main Line 104	–	6 miles (142 acres)	This 20-inch-diameter pipeline was buffered to create a 200-foot corridor based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011a). The source for the Project alignment is the BLM Fillmore Field Office (BLM 2013i).
UNEV, LLC Pipeline	Pipeline	Begins at Woods Cross, Utah and has terminals in Cedar City, Utah, and northeast of Las Vegas, Nevada	–	409 miles (4,961 acres)	This 12-inch-diameter pipeline was buffered to create a 100-foot corridor based on average scar widths visible on 2011 NAIP aerial imagery (NAIP 2011a). The source for the Project alignment is the BLM Fillmore Field Office (BLM 2006b).
Bureau of Land Management Moab Field Office					
Flatirons Resource, LLC No. 1-4 Helium Well Project (includes well pad, pipeline and compressor station)	Industrial	15 miles southwest of Mack, Colorado	–	7 acres (7 acres)	The development assumptions for this project are 0.8 acres of disturbance per well pad and a 25-foot corridor for the pipeline. The compressor station boundary is considered to be fully developed. These Project boundaries and assumptions are based on information in Flatirons Resources EA (BLM 2013j).
–	Oil and/or gas development	Throughout the Moab Field Office	U486, U487	248,370 acres (6,061 acres)	The development assumptions for this project are 4 acres of disturbance per well pad and a density of 1 well pad per 160 acres. These assumptions are based on information in the Reasonably Foreseeable Development Scenario for Oil and Gas Development for the Moab Field Office (BLM 2005g). The source for the project boundary is the BLM Utah State Office (BLM 2012ad).
Bureau of Land Management Price Field Office					
Anadarko Petroleum Corporation Ferron Natural Gas Project	Oil and/or gas development	North of Price, Utah	U498, U587, U628, U629, U765	108,680 acres (812 acres)	The development assumptions for this project are 1.38 acres of disturbance per well pad and a density of 1 well pad per 160 acres. The well pad size is based on the number of wells and well pad density within the project boundary and the density assumption is based on information in the Appeals from the Ferron Natural Gas Record of Decision (Interior Board of Appeals [BLM] 2003). The source for the project boundary is the BLM Price Field Office (BLM 1998b).
Bill Barrett Corporation Peter’s Point Loop Pipeline	Pipeline	T12S, R16E, Sec. 26, 27, 35	–	3 miles (18 acres)	This pipeline was digitized and buffered to create a 50 foot wide corridor based on maps and existing right-of-way widths given in the Peter’s Point Loop EA ¹ (BLM 2011r).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Bill Barrett Corp. West Tavaputs Plateau Project	Oil and/or gas development	30 miles east-northeast of Price, Utah	–	137,932 acres (1,723 acres)	The development assumptions for this project are 2 acres of disturbance per well pad and a density of 1 well pad per 160 acres. These assumptions are based on information in the West Tavaputs Plateau Record of Decision and Final EIS, (BLM 2010i). The source for the project boundary is the BLM Price Field Office (BLM 2012ae)
Interwest Mining Company Deer Creek Coal Mine, Coal Exploration	Coal mine	T16S, R6E, Sec. 22-27	U629	25,958 acres (25,958 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is TetraTech (Tetra Tech 2012).
–	Oil and/or gas development	Throughout the Price Field Office	U493, U494, U496, U537, U544, U585, U586, U587, U600, U629, U630	175,948 acres (872 acres)	The development assumptions for this project are 1 acre of disturbance per well pad and a density of 1 well pad per 160 acres. These assumptions are based on information in the Price Field Office Proposed RMP/Final EIS (BLM 2008d). The source for the project boundary is the BLM Utah State Office (BLM 2012ad).
Bureau of Land Management Richfield Field Office					
–	Oil and/or gas development	Throughout the Richfield Field Office	U600, U630	49,704 acres (4,934 acres)	The development assumptions for this project are 4 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions for well pad size are based on information in the Reasonably Foreseeable Development Scenario for Oil and Gas Development in the Richfield Field Office, March 2005 and the well pad density is based on information from Utah Administrative Code R649-3-Drilling and Operating Practices (State of Utah 2013c). The source for the project boundary is the BLM Utah State Office (BLM 2012ad).
Bureau of Land Management Salt Lake Field Office					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Bureau of Land Management Vernal Field Office					
Bill Barrett Corporation Blacktail Ridge Exploration and Development Agreement (EDA)	Oil and/or gas development	West of Duchesne, Utah	U421, U420	98,874 acres (6,108 acres)	The development assumptions for this project are 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Greater Uinta Basin Oil and Gas Cumulative Impacts Technical Support Document, March 2012 (BLM 2012af). The source for the project boundary is the URMCC (URMCC 2013a).
Bill Barrett Corporation Lake Canyon EDA	Oil and/or gas development	South of Fruitland, Utah	U424, U426	244,730 acres (15,341 acres)	The development assumptions for this project are 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Greater Uinta Basin Oil and Gas Cumulative Impacts Technical Support Document, March 2012 (BLM 2012af). The source for the project boundary is the URMCC (URMCC 2013a).
Encana North Chapita Wells Natural Gas Development	Oil and/or gas development	6 miles northwest of Bonanza, Utah	–	9,191 acres (453 acres)	The development assumptions for this project are 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Greater Uinta Basin Oil and Gas Cumulative Impacts Technical Support Document, March 2012 (BLM 2012af). The source for the project boundary is the BLM Vernal Field Office (BLM 2012ag).
Enduring Resources Rock House Development	Oil and/or gas development	11 miles southwest of Bonanza, Utah	–	4,859 acres (31 acres)	The development assumptions for this project are 2 acres of disturbance per well pad and a density of 1 well pad per 285.8 acres (17 pads distributed across 4859.2 acres). These assumptions are based on information in the Saddletree Draw Leasing and Rock House Development Proposal EA, December 2007 (BLM 2007c). The source for the project boundary is the BLM Vernal Field Office (BLM 2012ag).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
EOG Resources, Inc. Chapita Wells-Stagecoach Area Natural Gas Development	Oil and/or gas development	10 miles southeast of Ouray, Colorado	U300, U285	31,861 acres (220 acres)	The development assumptions for this project are 2.5 acres of disturbance per well pad and a density of 1 well pad per 320 acres. These assumptions are based on information in the Chapita Wells-Stagecoach Area Natural Gas Development Final EIS, January 2008 and the Greater Natural Buttes Final EIS, March 2012 for well pad size (BLM 2008h, 2012ai). The source for the project boundary is the BLM Vernal Field Office (BLM 2012ag).
Gasco Energy, Inc. Uinta Natural Gas Development Project	Oil and/or gas development	T9-11S, R14-19E	U400, U401	165,895 acres (15,833 acres)	The development assumptions for this project are 3.8 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Gasco Final EIS, June 2012 (BLM 2012ai). The source for the project boundary is the BLM Vernal Field Office (2011q).
Gilsonite Mines	Non-coal mine	Throughout the southern portion of the Vernal Field Office	U300, U242	174 miles (212 acres)	These linear mines were buffered to be 10 feet wide based on an average width of mining scars visible on 2011 NAIP aerial imagery (NAIP 2011d). The source for the project boundary is the BLM Vernal Field Office (BLM 2008i).
Kerr-McGee Oil and Gas Onshore LP Greater Natural Buttes Project	Oil and/or gas development	T8S, R20-23E T9S, R20-24E T10S, R20-23E T11S, R12-22E	U280, U285, U300	160,285 acres (9,955 acres)	The development assumptions for this project are 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in Greater Natural Buttes Final EIS, March 2012 (BLM 2012ah). The source for the project boundary is the BLM Vernal Field Office (BLM 2012aj).
Koch Exploration Company North Alger EA II	Oil and/or gas development	T10S, R19E, Sec. 27-28, 34-35 T11S, R19E, Sec 1	–	2,390 acres (210 acres)	The development assumptions for this project are 3.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the North Algers Project EA, October 2012 (BLM 2012ak). The source for the project boundary is the BLM Vernal Field Office (BLM 2012ag).
Newfield Gusher Development	Oil and/or gas development	5 miles northeast of Randlett, Utah	U391	38,138 acres (2,324 acres)	The development assumptions for this project are 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Greater Uinta Basin Oil and Gas Cumulative Impacts Technical Support Document, March 2012 (BLM 2012af). The source for the project boundary is the BLM Vernal Field Office (BLM 2012ag).
Petro-Canada Resources (USA), Inc. Rye Patch EA	Oil and/or gas development	21 miles south of Duchesne, Utah	–	5,506 acres (11 acres)	The development assumptions for this project are 2.1 acres of disturbance per well pad and a density of 1 well pad per 790.9 acres (seven pads distributed across 7,283 acres). These assumptions are based on information in the Rye Patch Exploratory Drilling EA, July 2007 (BLM 2007d). The source for the project boundary is the BLM Vernal Field Office (BLM 2012ag).
Questar Exploration and Production Company Greater Deadman Bench	Oil and/or gas development	8 miles northeast of Ouray, Colorado	U390, U310, U241	98,538 acres (5,772 acres)	The development assumptions for this project are 2.3 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Greater Deadman Bench Final EIS, January 2008 (BLM 2008j). The source for the project boundary is the BLM Vernal Field Office (BLM 2012ag).
Seep Ridge Road	Highway/road	From Ouray, Colorado to Uintah County line	–	702 acres (702 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the boundary is meant to represent the actual road development. The source for the project boundary is the BLM Vernal Field Office (BLM 2012al).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Stewart Petroleum Tumbleweed II	Oil and/or gas development	37 miles southwest of Bonanza, Utah	–	7,283 acres (16 acres)	The development assumptions for this project are 2.5 acres of disturbance per well pad and a density of 1 well pad per 1,040.4 acres (seven pads distributed across 7,283.1 acres). These assumptions are based on information in the Tumbleweed II Exploratory Natural Gas Drilling Project Final EA, June 2010 (BLM 2010j). The source for the project boundary is the BLM Vernal Field Office (BLM 2012ag).
XTO Energy Riverbend Directional Infill	Oil and/or gas development	T10S, R19-20E	U300, U400	17,127 acres (2,137 acres)	The development assumptions for this project are 2.5 acres of disturbance per well pad and a density of 1 well pad per 20 acres. These assumptions are based on information in the River Bend Unit Infill Development Environmental Assessment and Biological Assessment, July 2012 (BLM 2012am). The source for the project boundary is the BLM Vernal Field Office (BLM 2012ag).
–	Habitat/rangeland management ⁵	Throughout the Vernal Field Office	U241, U242, U421, U401	122,122 acres (122,122 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of habitat/rangeland management activities is unknown. The source for the project boundary is the BLM Vernal Field Office (BLM 2012an).
–	Oil and/or gas development	Throughout the Vernal Field Office	U241, U280, U310, U290, U431, U300, U400	395,068 acres (14,152 acres)	The development assumptions for this project are 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Greater Uinta Basin Oil and Gas Cumulative Impacts Technical Support Document, March 2012 (BLM 2012af). The source for the project boundary is the BLM Utah State Office (BLM 2012ad).
–	Vegetation management ⁴	Throughout the Vernal Field Office	U241	68,956 acres (68,956 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of vegetation management activities is unknown. The source for the project boundary is the BLM Vernal Field Office (BLM 2013k).
Ashley National Forest					
Berry Petroleum South Unit Oil and Gas Development	Oil and/or gas development	Between Antelope and Sowers Canyon in the Duchesne Ranger District	U431	25,608 acres (237 acres)	The development assumptions for this project are 1 acres of disturbance per well pad and a density of 1 well pad per 106.7 acres (six pads per section; section = 640 acres). These assumptions are based on information in the South Unit Oil and Gas Development Project Record of Decision, February 2012 (USFS 2012f). The source for the project boundary is the Ashley National Forest (USFS 2007c).
Manti-La Sal National Forest					
Canyon Fuel Company, LLC Skyline Mine	Coal mine	3 miles west of Clear Creek, Utah	U600	10,455 acres (10,455 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the Utah Division of Natural Resources (UDNR 2013a).
Fossil Rock Fuels, LLC Coal Exploration Drilling	Coal mine	10 miles northwest of Orangeville, Utah	–	8,707 acres (8,707 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the Manti-La Sal National Forest (USFS 2012g).
Liberty Pioneer Energy Source, Inc. Liberty Pioneer #10-17 Gas Exploration	Oil and/or gas development	25 miles northwest of Huntington, Utah along Utah State Route 31 in Sanpete County	–	2 acres (2 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the Manti-La Sal National Forest 2012 (USFS 2012h).
Millers Flat Project	Vegetation management ⁴	10 miles east of Mount Pleasant, Utah	U630	15,328 acres (15,328 acres)	The development assumption for this project is to use the entire project boundary since the extent of the vegetation management activities unknown. The source for the project boundary is the Manti-La Sal National Forest (USFS 2012i).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Sunroc Corporation Chicken Creek Surface Gypsum Mine	Non-coal mine	2 miles east of Levan, Utah	–	38 acres (38 acres)	The development assumption for this surface mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the Manti-La Sal National Forest (USFS 2012j).
Uinta-Wasatch-Cache National Forest					
Sheep Creek Project	Vegetation management ⁴	North and west of Gilluly, Utah	U433, U539, U530	9,190 acres (9,190 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of the vegetation management activities is unknown. The source for the project boundary is the Uinta-Wasatch-Cache National Forest (USFS 2012k).
Utah Reclamation Mitigation and Conservation Commission (URMCC)					
Lower Duchesne River Wetlands Project	Habitat/ rangeland management ⁵	East of Myton, Utah	–	5,114 acres (5,114 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of the habitat/rangeland activities is unknown. The source for the project boundary is the URMCC (URMCC 2013b) .
State					
Central Utah Water Conservancy District					
Roosevelt Pipeline	Pipeline	Extends from Roosevelt, Utah, to the west 9 miles	U420	18 miles (6,371 acres)	This pipeline was buffered to create a 3,000-foot corridor based on direction from the Central Utah Water Conservancy District to avoid affecting the pipeline with the proposed Project. The source for the project boundary is the Central Utah Water Conservancy District (Central Utah Water Conservancy District 2012).
State of Utah School and Institutional Trust Lands Administration (SITLA)					
Red Leaf Resources Red Leaf Project	Oil shale and/or tar sand	Uinta Basin, Utah	–	16,803 acres (16,803 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the SITLA (SITLA 2012a).
University of Utah leases	Educational	8 miles southeast of Columbia, Utah	–	2,802 acres (2,802 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the SITLA (SITLA 2013a).
Utah National Guard Engineering Battalion training area	Military training/testing site	6 miles east of Price, Utah	–	163 acres (163 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the SITLA (SITLA 2013a).
White Sands Missile Launch Facility (abandoned)	Military training/testing site	Near Green River, Utah	U487	728 acres (728 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the SITLA (SITLA 2013a).
–	Coal and Non-coal mine	Throughout the Project area	U241, U280, U285, U300, U310, U390, U400, U406, U410, U430, U432, U460, U486, U487, U488, U489, U490, U493, U495, U496, U498, U523, U524, U530, U537, U546, U548, U585, U586, U587, U600, U621, U625, U628, U629, U631, U636, U638, U650, U730, U731, U765	1,038,793 acres (1,038,793 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the SITLA (SITLA 2013b).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
–	Oil and/or gas development	Throughout the Project area	U241, U280, U285, U300, U310, U390, U400, U401, U406, U408, U409, U410, U411, U430, U432, U435, U436, U486, U487, U488, U489, U490, U493, U495, U496, U498, U512, U514, U516, U520, U523, U524, U527, U537, U546, U548, U585, U586, U587, U600, U621, U628, U629, U631, U636, U638, U650, U730, U731, U734, U765	760,835 acres (15,381 acres)	The development assumptions for this project are 3 acres of disturbance per well pad and a density of 1 well pad per 107 acres. This is an average of 6 wells per section based on Utah Department of Oil, Gas, and Mining map found at this website: http://stage.mapserv.utah.gov/oilgasmining/ (State of Utah 2013d). The source for the project boundary is the SITLA (SITLA 2013c).
–	Oil shale tar sands development	Throughout the Project area	U280, U285, U300	143,677 acres (143,677 acres)	The development assumption for this project is to consider the area within the project boundary since development at this point is unknown. The source for the project boundary is the SITLA (SITLA 2013c).
Utah Division of Natural Resources – Oil, Gas and Mining					
Andalex Resources, Inc. Centennial Mine	Coal mine	6 miles northeast of Helper, Utah	–	6,556 acres (6,556 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Canyon Fuel Company, LLC Banning Siding Loadout	Coal mine	8 miles east of Wellington, Utah	–	40 acres (40 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Canyon Fuel Company, LLC Dugout Canyon Mine	Coal mine	11 miles northeast of Wellington, Utah	–	9,383 acres (9,383 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Canyon Fuel Company Soldier Canyon Mine	Coal mine	12 miles northeast of Wellington, Utah	U523	7,140 acres (7,140 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Carbon Resources, LLC Kinney # 2	Coal mine	East of Scofield, Utah	–	709 acres (709 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Castle Valley Mining, LLC Bear Canyon Mine	Coal mine	10 miles west of Huntington, Utah	–	10,831 acres (10,831 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
COVOL Engineered Fuels, LLC COVOL Site	Coal mine	Industrial area on Ridge Road, Carbon County, Utah	–	31 acres (31 acres)	The development assumption for this surface mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Energy West Mining Company Cottonwood Waste Rock Site	Coal mine	12 miles northwest of Orangeville, Utah	–	2,153 acres (2,153 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Hiawatha Coal Company, Inc. Hiawatha Mine	Coal mine	15 miles southwest of Price, Utah	–	11,623 acres (11,623 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Hidden Splendor Resources Horizon Mine	Coal mine	5 miles east of Scofield, Utah	–	1,539 acres (1,539 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Intermountain Power Agency Wildcat Loadout	Coal mine	3 miles west of U.S. Highway 6, on Consumers Road near Helper, Utah	U548	268 acres (268 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
PacifiCorp Trial Mountain Mine	Coal mine	12 miles west of Orangeville, Utah	–	3,492 acres (3,492 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Savage Services Corporation Savage Coal Terminal	Coal mine	4 miles south-southeast of Price, Utah	–	166 acres (166 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Sunnyside Cogeneration Associates Star Point Waste Fuel	Coal mine	3 miles north of Hiawatha, Utah	–	156 acres (156 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Sunnyside Cogeneration Associates Sunnyside Refuse/Slurry	Coal mine	25 miles east of Price, Utah	–	331 acres (331 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Utah American Energy, Inc. Horse Canyon Mine (Lila Canyon extension)	Coal mine	7 miles east of Cedar, Utah	–	4,566 acres (4,566 acres)	The development assumption for this surface mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
West Ridge Resources, West Ridge Mine	Coal mine	10 miles north of Sunnyside, Utah	–	5,990 acres (5,990 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the UDNR (UDNR 2013b).
Local					
Carbon County					
All-Terrain Vehicle Trail	Local development (recreation)	North of Price, Utah, to the southeast, terminating near Sunnyside, Utah	U492	36 miles (66 acres)	The development assumption for this project is the trail centerline is buffered to 15 feet wide based on existing portions of the trail in 2011 NAIP aerial imagery. The source for the Project alignment is Carbon County (Carbon County, Utah 2011a).
Clear Creek subdivision	Residential subdivision	4 miles south of Scofield, Utah	–	19 acres (19 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Utah 2011b).
Dennis Plat of Spring Glen subdivision	Residential subdivision	1 mile south of Helper, Utah	–	23 acres (23 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Utah 2011b).
Frank Jr. and Judy Saccomanno subdivision	Residential subdivision	1 mile southeast of Helper, Utah	–	5 acres (5 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Utah 2011b).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Kenilworth subdivision	Residential subdivision	2 miles east of Helper, Utah	–	42 acres (42 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Utah 2011b).
Spring Glen Townsite	Residential subdivision	1 mile south of Helper, Utah	–	53 acres (53 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Utah 2011b).
Theo Vista subdivision	Residential subdivision	1 mile south of Helper, Utah	–	5 acres (5 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Utah 2011b).
City of Helper					
Castle Gate Addition subdivision	Residential subdivision	Western portion of the city limits of Helper, Utah	–	69 acres (69 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Utah 2011b).
Fitch’s subdivision	Residential subdivision	Western portion of the city limits of Helper, Utah	–	1 acre (1 acre)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Utah 2011b).
Giacoletto subdivision	Residential subdivision	Northern portion of the city limits of Helper, Utah	–	2 acres (2 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Utah 2011b).
Hillcrest Addition subdivision	Residential subdivision	Eastern portion of the city limits of Helper, Utah	–	6 acres (6 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Utah 2011b).
New Helper Townsite subdivision	Residential subdivision	Northern portion of the city limits of Helper, Utah	–	23 acres (23 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Utah 2011b).
Sheya Addition subdivision	Residential subdivision	Within the municipal boundary of Helper, Utah	–	8 acres (8 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Carbon County (Carbon County, Utah 2011b).
Daggett County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Duchesne County					
Airport Estates subdivision	Residential subdivision	On the western edge of Roosevelt, Utah	–	323 acres (323 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Arch View Ranchettes subdivision	Residential subdivision	15 miles west of Duchesne, Utah	U421	51 acres (51 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Brad Knight subdivision	Residential subdivision	2 miles south of Roosevelt, Utah	–	21 acres (21 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Cedar Mountain No. 6 and 6A subdivision	Residential subdivision	22 miles west of Duchesne, Utah	U426	1,698 acres (1,698 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Cedar Mountain No. 8 subdivision	Residential subdivision	6 miles west of Duchesne, Utah	–	334 acres (334 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Cedar Mountain No. 9 subdivision	Residential subdivision	13 miles west of Duchesne, Utah	U421	1,967 acres (1,967 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Cove Estates subdivision	Residential subdivision	Northern portion of Roosevelt municipal boundary, Utah	–	416 acres (416 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Dale Gines subdivision	Residential subdivision	6 miles north of Duchesne, Utah	–	102 acres (102 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Deer Field subdivision	Residential subdivision	25 miles west of Duchesne, Utah	–	43 acres (43 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Elk Tracks at Golden Eagle subdivision	Residential subdivision	5 miles northwest of Duchesne, Utah	U420	789 acres (789 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Fruitland Ranchettes subdivision	Residential subdivision	24 miles west of Duchesne, Utah	–	26 acres (26 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Golden Eagle subdivision	Residential subdivision	5 miles northwest of Duchesne, Utah	–	359 acres (359 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Great Basin Estates I subdivision	Residential subdivision	7 miles northwest of Duchesne, Utah	U420	319 acres (319 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Hidden Meadow subdivision	Residential subdivision	24 miles west of Duchesne, Utah	–	63 acres (63 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Highland Estates subdivision	Residential subdivision	2 miles south of Roosevelt, Utah	–	12 acres (12 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Ioka Meadows subdivision	Residential subdivision	2 miles southwest of Roosevelt, Utah	–	38 acres (38 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Karren Industrial Park	Industrial	Directly south of the City of Roosevelt municipal boundary, Utah	–	20 acres (20 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this industrial park is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Lazy JP Ranchettes subdivision	Residential subdivision	23 miles west of Duchesne, Utah	U426	70 acres (70 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Ledge Rock Cove subdivision	Residential subdivision	6 miles west of Roosevelt, Utah	–	36 acres (36 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Lobo Ranchettes subdivision	Residential subdivision	20 miles northeast of Price, Utah	–	368 acres (368 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Moondance Ranch Phase I and II subdivision	Residential subdivision	6 miles southeast of Duchesne, Utah	U430, U431	4,162 acres (4,162 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Pheasant Run subdivision	Residential subdivision	3 miles southwest of Roosevelt, Utah	–	13 acres (13 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
River Breeze Estates subdivision	Residential subdivision	5 miles north of Duchesne, Utah	U420	32 acres (32 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Robbers Roost subdivision	Residential subdivision	25 miles west of Duchesne, Utah	–	80 acres (80 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Rosalinda Park subdivision	Residential subdivision	4 miles north of Duchesne, Utah	–	24 acres (24 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Silver Moon subdivision	Residential subdivision	5 miles southeast of Duchesne, Utah	U430, U431	6,443 acres (6,443 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Sundown Ridge subdivision	Residential subdivision	26 miles west of Duchesne, Utah	U426	141 acres (141 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Sunrise Estates subdivision	Residential subdivision	4 miles southwest of Roosevelt, Utah	–	21 acres (21 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Tabby Shadows subdivision	Residential subdivision	15 miles west-northwest of Duchesne, Utah	U421	659 acres (659 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Uintah Haven subdivision	Residential subdivision	5 miles north of Duchesne, Utah	U420	50 acres (50 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Uintah View Ranches subdivision	Residential subdivision	1 mile north of Duchesne, Utah	–	2,511 acres (2,511 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Valle Del Padre subdivision	Residential subdivision	25 miles west of Duchesne, Utah	–	441 acres (441 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Victory Pipeline	Water pipeline	Duchesne County	U410, U430	746 acres (746 acres)	The development assumption is to use the shapefile boundary provided by Jones and DeMille Engineering (Jones and DeMille Engineering 2013)
View subdivision	Residential subdivision	2 miles south of Roosevelt, Utah	–	12 acres (12 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Vista Valley subdivision	Residential subdivision	18 miles west of Duchesne, Utah	U421, U425	768 acres (768 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Vonsville subdivision	Residential subdivision	1 mile south of Roosevelt, Utah	–	157 acres (157 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Wasatch Meadow subdivision	Residential subdivision	26 miles west of Duchesne, Utah	–	69 acres (69 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
West Star Properties	Residential subdivision	20 miles west of Duchesne, Utah	U421	79 acres (79 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).
Young Meadows subdivision	Residential subdivision	20 miles west of Duchesne, Utah	–	934 acres (934 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Duchesne County February 2012 (Duchesne County 2009).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Emery County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Grand County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Juab County					
Birch Creek subdivision	Residential subdivision	Adjacent to Nortonville of Juab, 6 miles north and west of Nephi, Utah	–	13 acres (13 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Juab County (Juab County 2009).
Burraston View subdivision	Residential subdivision	Adjacent to Old 91, and Burraston Hill of Juab, 6 miles north and west of Nephi, Utah	–	40 acres (40 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Juab County (Juab County 2009).
Burraston Hill of Juab subdivision	Residential subdivision	Adjacent to Burraston View, and Old 91, 6 miles north and west of Nephi, Utah	–	40 acres (40 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Juab County (Juab County 2009).
Majestic Estates subdivision	Residential subdivision	6 miles north and west of Nephi, Utah	–	7 acres (7 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Juab County (Juab County 2009).
Nortonville subdivision	Residential subdivision	Adjacent to Birch Creek, 6 miles north and west of Nephi, Utah	–	13 acres (13 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Juab County (Juab County 2009).
Old 91 subdivision	Residential subdivision	Adjacent to Burraston View, and Burraston Hill of Juab, 6 miles north and west of Nephi, Utah	–	40 acres (40 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Juab County (Juab County 2009).
West Creek of Moab subdivision	Residential subdivision	6 miles north and west of Nephi, Utah	–	26 acres (26 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Juab County (Juab County 2009).
Nephi City					
Deer Acre Plat ‘B’ subdivision	Residential subdivision	Eastern edge of the municipal boundary of Nephi, Utah	–	6 acres (6 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Juab County (Juab County 2009).
Sanpete County					
Mount Baldy subdivision	Residential subdivision	7 miles northeast of Fountain Green, Utah	–	307 acres (307 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Sanpete County (Sanpete County 2009).
Uintah County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Utah County					
Solider Summits residential estates	Residential subdivision	13 miles north of Scofield, Utah	U530	811 acres (811 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since this subdivision is not fully developed. The source for the project boundary is Utah County (Utah County 2009).
Wasatch County					
There are not any actions identified or data received to be used in cumulative analysis					
Additional Actions ⁶					
LANDFIRE™					
–	–	Throughout the Project area	–	–	The development assumption for land fire data is based on the following attributes: Agriculture-Cultivated Crops and Irrigated Agriculture: Value = 82 Agriculture-Pasture and Hay: Value = 81 Developed-High Intensity: Value = 24 Developed-Medium Intensity = Value 23 Developed-Roads = Value 25 Developed-Upland Deciduous Forest = Value 13 Developed-Upland Evergreen Forest = Value 14 Developed-Upland Herbaceous = Value 16 Developed-Upland Mixed Forest = Value 15 Developed-Upland Shrubland = Value 17 National Agricultural Statistics Service (NASS)-Close Grown Crop = Value 65 NASS-Fallow/Idle Cropland = Value 66 NASS-Orchard = Value 60 NASS-Row Crop = Value 64 NASS-Row Crop-Close Grown Crop = Value 63 Quarries-Strip Mines-Gravel Pits = Value 32 Recently Disturbed Developed Upland Deciduous Forest = Value 2541 Recently Disturbed Developed Upland Evergreen Forest = Value 2542 Recently Disturbed Developed Upland Herbaceous = Value 2544 Recently Disturbed Developed Upland Mixed Forest = Value 2543 Recently Disturbed Developed Upland Shrubland = Value 2545 Recently Disturbed Orchard Vegetation = Value 2548 Recently Disturbed Pasture and Hayland = Value 2549 The source for the boundaries is LANDFIRE (LANDFIRE 2012)
Transmission Line					
–	Transmission line	Throughout the Project area	–	–	The development assumption for transmission lines is based on averaging corridor widths estimated by 2011 and 2012 NAIP aerial imagery interpretation (NAIP 2011b). 500kV transmission lines: 225-foot-wide corridor 345kV transmission lines: 150-foot-wide corridor 230kV transmission lines: 100-foot-wide corridor 138kV transmission lines: 75-foot-wide corridor 115kV transmission lines: 50-foot-wide corridor The source for transmission line alignments is POWERmap Platts as digitized by EPG (POWERmap Platts 2009).

TABLE 4-1 PAST AND PRESENT ACTIONS					
Applicant Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Ground Disturbance)	Assumptions for Analysis ³
Pipelines					
—	Pipeline	Throughout the Project area	—	—	The development assumption for pipelines is based on averaging corridor widths estimated by 2011 and 2012 NAIP aerial imagery interpretation (NAIP 2011a). 30- to 42-inch-diameter pipelines: 300-foot-wide corridor 20- to 26-inch-diameter pipelines: 200-foot-wide corridor 10- to 18-inch diameter pipelines: 100-foot-wide corridor 6- to 8.6-inch diameter pipelines: 50-foot-wide corridor The source for pipeline alignments is POWER Engineers (POWER 2012).
Highways/Roads					
—	Transportation	Throughout the Project area	—	—	The development assumption for highways and roads is based on averaging corridor widths estimated by 2011 and 2012 NAIP aerial imagery interpretation (NAIP 2011e). Interstate highways: 75-foot-wide corridor Intra-state/Intra-metro Area/Inter-metro Area: 50-foot-wide corridor City/County/Local: 25-foot-wide corridor The source for the road alignments are the U.S. Department of Transportation (2008) and Automated Geographic Reference Center (2012).
Railroads					
—	Transportation	Throughout the Project area	—	—	The development assumption for railroads is an average corridor width of 25 feet based on 2011 and 2012 NAIP aerial imagery interpretation (NAIP 2011e). The source for railroad alignments is the U.S. Department of Transportation (2008).
NOTES: ¹All locations are approximate unless township/range/section is provided. ²The acreage and mileage is calculated from the available data received from agencies or digitized maps. The total acreage is based on the data boundary received from an agency and may not directly reflect what is described in the project description. ³The assumptions were used in the quantification portion of the cumulative analysis to achieve an approximate amount of disturbance for each activity. ⁴Vegetation management activities include but not are not limited to prescribed fires; chemical and mechanical weed treatments; mastication; mowing; bullhog; cut and pile; cut, pile, and burn; lop and scatter; plantings; chaining; stream channel work; shaded fuel breaks; etc. ⁵Habitat/rangeland management activities include but are not limited to gate, pond, well, corral, check dam, erosion structure, cattleguard, pit, water trough, seep, etc. ⁶Additional activities are datasets of existing development but are not called out as individual projects. Rural residential development, farming, grazing, private airstrips, transportation, and mining claims are dispersed throughout the Project area; however, data inventory for these categories was limited to the 2-mile-wide alternative route study corridors. During the analysis, a few past and present actions were identified for which data either have not been received from the field offices or were received after analysis began and will be added between the Draft and Final EIS. These past and present actions include: ▪ Little Snake Field Office • Sand Wash Artillery Range Site and Craig Range National Guard Training Site (waiting on information from CH2MHill) ▪ Moab Field Office • Vegetation/habitat management activities ▪ Manti-La Sal National Forest • Dry Canyon Fuels • Questar Pipeline • Gooseberry Campground • Spoon Creek Timber Sales					

TABLE 4-2 REASONABLY FORESEEABLE FUTURE ACTIONS					
Applicant/Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Surface Disturbance)	Assumptions for Analysis ³
Multi-state Actions					
Bureau of Land Management (BLM) Wyoming State Office					
Idaho Power and Rocky Mountain Power Gateway West 500-kilovolt (kV) Transmission Project	Transmission line	Starts at Windstar Substation near Dave Johnston Power Plant in Wyoming to Hemingway Substation near Melba, Idaho	W15, W30, W35, W36	1,114 miles (31,539 acres)	The development assumption buffers the centerline for the double-circuit 500-kilovolt (kV) sections and the single-circuit 500kV section for a 250-foot-wide corridor; and the 230kV section, for a 125-foot-wide corridor. This is based on information in the Gateway West Draft Environmental Impact Statement (EIS), 2011 (BLM 2011t). The source of the project alignment is Tetra Tech (Tetra Tech 2013).
TransWest Express, LLC TransWest Express 500kV Transmission Project	Transmission line	Begins near Sinclair, Wyoming, and terminates near Las Vegas, Nevada; with possible alternative routes proposed in Colorado and Utah	W102, W110, W111, W113, W116, W117, W120, W121, W124, W15, W16, W22, W27, W299, W30, W300, W302, W32, W321, W36, W409, W411C100, C101, C105, C106, C13, C170, C175, C177, C185, C186, C187, C188, C195, C196, C197, C270, C61, C91, U241, U285, U300, U310, U390, U400, U401, U404, U406, U410, U420, U421, U424, U427, U429, U430, U431, U432, U433, U435, U460, U486, U487, U488, U490, U496, U498, U523, U524, U525, U530, U537, U539, U544, U545, U546, U548, U585, U586, U587, U600, U621, U625, U628, U629, U630, U631, U636, U637, U638, U639, U650, U728, U729, U730, U731, U732, U733, U734, U765	2,551 miles (77,182 acres)	The development assumption buffers the centerline for a 250-foot-wide right-of-way based on information in the right-of-way application submitted in 2010 (TransWest Express LLC 2010). The source of the project alignment is AECOM (AECOM 2013).
Bureau of Land Management Rock Springs and Little Snake Field Offices					
Questar Exploration and Production Company, Wexpro Company, and other natural gas development companies Hiawatha Regional Energy Development Project	Oil and/or gas development	Northwest Colorado/southwest Wyoming	–	158,114 acres (7,552 acres)	The development assumptions for this project are 1.9 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions and the project boundary are based on information in the public scoping announcement in 2006 (BLM 2006c).
Wyoming					
Federal					
Bureau of Land Management Rawlins Field Office					
Ambre Energy Anadarko Rosebud Mine	Coal mine	Northeast of Hanna, Wyoming	W21, W22	12,644 acres (12,644 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is Ambre Energy (Ambre Energy 2012a).
BP (consortium) Continental Divide-Creston Natural Gas Project	Oil and/or gas development	25 miles west of Rawlins, Wyoming, within Carbon and Sweetwater counties	W101, W102, W107, W108, W109, W110, W111, W116, W117, W120, W125, W128, W27, W32	1,028,334 acres (66,723 acres)	The development assumptions for this project are 2.6 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Project Draft EIS and Plan of Development 2012 (BLM 2012ao). The source of the project boundary is the BLM Rawlins Field Office (BLM 2007g).
Warren Exploration and Production, Inc., Double Eagle Petroleum Company, and Anadarko Exploration and Production Company Doty Mountain Plan D	Oil and/or gas development	19 miles southwest of Rawlins, Wyoming	–	1,368 acres (17 acres)	The development assumptions for this project are 2 acres of disturbance per well pad and a density of 1 well pad per 152 acres (9 wells distributed across 1,368 acres). These assumptions are based on information in the Plan of Development, 2012 (BLM 2012ap). The source of the project boundary is the BLM Rawlins Field Office (BLM 2012aq).

TABLE 4-2 REASONABLY FORESEEABLE FUTURE ACTIONS					
Applicant/Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Surface Disturbance)	Assumptions for Analysis ³
Whirlwind I	Wind energy facility	2 miles southwest of Rawlins, Wyoming	W30, W32	42,568 acres (255 acres)	The development assumptions for this project are 1.0 acres of disturbance per turbine pad and a density of 1 turbine pad per 167 acres. These assumptions are based on averaging wind-turbine pad sizes for existing projects in the roject area. The density assumption was developed by evenly spacing 300 turbines within the project-area boundary. The source of this information is from BLM National Environmental Policy Act (NEPA) Hotsheet released in January 2013 and reviewing the National Agricultural Information Program (NAIP) 2012 aerial imagery (BLM 2013l). The source for the project boundary is the BLM Rawlins Field Office (BLM 2013m).
Bureau of Land Management Rock Spring Field Office					
Ambre Energy Black Butte Mine	Coal mine	25 miles east of Rock Springs, Wyoming	–	45,846 acres (45,846 acres)	The development assumption for this surface mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is Ambre Energy (Ambre Energy 2012b).
Anadarko Petroleum Corp. Monell/Arch Unit Infill Project – Monell Unit	Oil and/or gas development	35 miles east of Rock Springs, Wyoming	–	10,146 acres (509 acres)	The development assumptions for this project are 2 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the public scoping notice, 2012 (BLM 2012ar). The source for the project boundary is the BLM Rock Springs Field Office (BLM 2012as).
Anadarko Petroleum Corp. Monell/Arch Unit Infill Project – Arch Unit	Oil and/or gas development	35 miles east of Rock Springs, Wyoming	–	12,540 acres (312 acres)	The development assumptions for this project are 1 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the public scoping notice, 2012 (BLM 2012ar). The source for the project boundary is the BLM Rock Springs Field Office (BLM 2012as).
Evergreen Wind Power Partners, LLC Quaking Aspen Mountain	Wind energy facility	Southeast of Rock Springs, Wyoming	–	7,172 acres (109 acres)	The development assumptions for this project are 1.0 acres of disturbance per turbine pad and a density of 1 turbine pad per 65 acres. These assumptions are based on averaging wind-turbine pad sizes for similar existing wind projects in the Project area. The density assumption was developed by evenly spacing 79 turbines within the project-area boundary. The source of this information is from the scoping notice extension in 2011 (BLM 2011u). The source for the project boundary is the BLM Rock Springs Field Office (BLM 2012at).
Sweeney Ranch Wind Park, LLC Sweeney Ranch	Wind energy facility	9 miles south of Thayer Junction, Wyoming	–	12,097 acres (329 acres)	The development assumptions for this project are 1.0 acre of disturbance per turbine pad and a density of 1 turbine pad per 36 acres. The density assumption was developed by evenly spacing 150 turbines within the project area boundary. The source of this information is the BLM NEPA Hotsheet, January 2013 (BLM 2013l). The source for the project boundary is BLM Rock Springs Field Office (BLM 2009i).
Teton Wind, LLC White Mountain Wind Farm	Wind energy facility	Located west-northwest of Rock Springs, Wyoming (T19N & 20N, R105W and 106W)	–	13,165 acres (191 acres)	The development assumptions for this project are 0.8 acres of disturbance per turbine pad and a density of 1 turbine pad per 54.85 acres. The density assumption was developed by evenly spacing 240 turbines within the project area boundary. The source of these assumptions is from the Environmental Assessment (EA) in 2010 (BLM 2010k). The source for the project boundary is the BLM Rock Springs Field Office (BLM 2012at).
State					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Local					
Carbon County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					

TABLE 4-2 REASONABLY FORESEEABLE FUTURE ACTIONS					
Applicant/Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Surface Disturbance)	Assumptions for Analysis ³
Sweetwater County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Colorado					
Federal					
Bureau of Land Management Grand Junction Field Office					
–	Oil and/or gas development	20 miles northwest of De Beque, Colorado	–	23,682 acres (228 acres)	The development assumptions for these units are 1.5 acres of disturbance per well pad and a density of 1 well pad per 160 acres. These assumptions are based on information in the Reasonable Foreseeable Development Scenario for Oil and Gas, Grand Junction Field Office 2012 (BLM 2012x). The source of the project boundary is the BLM Colorado State Office (BLM 2012x).
Bureau of Land Management Little Snake Field Office					
Tri-State Generation and Transmission Association, Salt River Project Agricultural Improvement and Power District, Platte River Power Authority, and PacifiCorp Trapper Mine	Coal mine	Southwest of Craig, Colorado, east of Colorado State Highway 13	–	10,186 acres (10,186 acres)	The development assumption for this surface mine including the entire area within the project boundary as the development area, since the extent of the development at this point is unknown. The boundary was provided by Trapper Mine (Trapper Mining, Inc. 2012).
–	Oil and/or gas development	9 miles southeast of Moffat, Colorado	–	11,974 acres (1,205 acres)	The development assumptions for these units are 4 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Reasonable Foreseeable Development: Oil and Gas in the Little Snake Field Office Administrative Boundary Area, 2004 (BLM 2004d). The source of the project boundary is the BLM Colorado State Office (BLM 2012x).
Bureau of Land Management White River Field Office					
ExxonMobil Exploration Company and Natural Soda Holdings, Inc. Colorado Oil Shale Research Development, and Demonstration Lease Tracts Project	Oil shale and/or tar sand development	Site 1 is located at T1S, R98W, Sec.35 (Lots 1, 2, 3, and 4) Site 2 is located at T1S, R98W, Sec. 34 (Lots 1, 2, 7, and 8)	–	359 acres (359 acres)	The development assumption for this project is to consider the area within the project lease area as the development area since development occurs throughout the project lease area. The source for the project boundary is from the ExxonMobil Exploration Company and Natural Soda Holdings, Inc. Colorado Oil Shale Research, Development, and Demonstration Lease Tracts Project EA, 2012 (BLM 2012au). The source for the project boundary is the BLM White River Field Office (2010l).
State					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Local					
Garfield County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Mesa County					
Clouse No. 1 and No. 2 Simple Land Divisions	Local development (annexation/ land division)	12 miles northeast of Fruita, Colorado	–	87 acres (87 acres)	The development assumption for this project is to use the entire land division area. The boundary was provided by Mesa County as a GIS shapefile (Mesa County 2011).
Moffat County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Rio Blanco County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Routt County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					

TABLE 4-2 REASONABLY FORESEEABLE FUTURE ACTIONS					
Applicant/Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Surface Disturbance)	Assumptions for Analysis ³
Utah					
Federal					
Bureau of Land Management Fillmore Field Office					
Ferner Valley Analysis Area	Vegetation management ⁴	7 miles east of Jericho, Utah	–	8,046 acres (8,046 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of vegetation management activities is unknown. The source for the project boundary is the BLM Fillmore Field Office (BLM 2012ac).
Levan Pastures Analysis Area	Vegetation management ⁴	5 miles west of Levan, Utah	–	3,163 acres (3,163 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of vegetation management activities is unknown. The source for the project boundary is the BLM Fillmore Field Office (BLM 2012ac).
Mona South Pumped Storage Project	Transmission line	In Wide Canyon, 4 miles southwest of Mona, Utah	–	Transmission: 4.7 miles (143 acres) Facilities: 394 acres	Transmission line: The development assumption buffers the 4.7-mile-long centerline for a 250-foot-wide right-of-way based on information developed by EPG of average right-of-way widths for transmission lines of different voltages, 2013. ⁵ The source for the Project alignment is the BLM Fillmore Field Office (BLM 2013n). Facilities: The development assumption for this project is to use the entire project boundary since development at this point is unknown. The source for the project boundary is the BLM Fillmore Field Office (BLM 2013n).
Mona North Pumped Storage Project	Transmission line	Old Canyon stream in the Long Ridge area west of Mona, Utah	–	Transmission: 6 miles (182 acres) Facilities: 833 acres	Transmission line: The development assumption buffers the 6-mile-long centerline for a 250-foot-wide right-of-way based on information developed by EPG of average right-of-way widths for transmission lines of different voltages, 2013. ⁵ The source for the Project alignment is the BLM Fillmore Field Office (BLM 2013o). Facilities: The development assumption for this project is to use the entire project boundary since development at this point is unknown. The source for the project boundary is the BLM Fillmore Field Office (BLM 2013o).
Bureau of Land Management Moab Field Office					
–	Oil and/or gas development	9 miles south of Cisco, Utah	–	26,069 acres (662 acres)	The development assumptions for this project are 4.0 acres of disturbance per well pad and a density of 1 well pad per 160 acres. These assumptions are based on information in the Reasonably Foreseeable Development Scenario for Oil and Gas, Moab Field Office (BLM 2005g). The source for the project boundary is the BLM Utah State Office (BLM 2012ac).
Bureau of Land Management Price Field Office					
Wasatch Natural Resources Long Canyon Coal Lease	Coal mine	3 miles east of Scofield along a north-south trending ridge east parallel to Pleasant Valley/Scofield	–	7,623 acres (7,623 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the BLM Price Field Office (BLM 2012aw).
Woodside Site	Power generation	Boundary encompasses 50 miles around Green River and East Carbon, Utah	U488, U489, U734	50,046 acres (50,046 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The Woodside substation assumption is 6.5 acres. The source for these boundaries is the BLM Price Field Office (BLM 2012aw).
–	Oil and/or gas development	4 miles southwest of Woodside, Utah	U734	11,919 acres (292 acres)	The development assumptions for this project are 1.0 acre of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Price Proposed Resource Management Plan/Final EIS, 2008 (BLM 2008d). The source for the project boundary is the BLM Utah State Office (BLM 2012ac).
Bureau of Land Management Richfield Field Office					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					

TABLE 4-2 REASONABLY FORESEEABLE FUTURE ACTIONS					
Applicant/Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Surface Disturbance)	Assumptions for Analysis ³
Bureau of Land Management Salt Lake Field Office					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Bureau of Land Management Vernal Field Office					
Newfield Corporation Monument Butte EIS	Oil and/or gas development	T8S, R15E, Sec. 24-26, 35, 36 T8S, R16E, Sec. 13-15, 19-36 T8S, R17E Sec. 14-36 T8S, R18E Sec. 19-21, 25-36 T8S, R19E, Sec. 31,32 T9S, R19E, Sec. 4-9, 17-20 T9S, R18E, Sec. 1-35 T9S, R16-17E, all sections T9S, R15E, Sec.1-3, 10-12, 13-15, 22-24, 25-27, 34-36	–	119,669 acres (7,213 acres)	The development assumptions for this project are 1.2 acres of disturbance per well pad and a density of 1 well pad per 20 acres. These assumptions are based on information in the Newfield Master Development Plan No. 6 EA, 2011 (BLM 2011v). The source for the project boundary is the BLM Vernal Field Office (BLM 2012ag).
–	Oil and/or gas development	4 miles southeast of Ouray, Utah	U300	44,726 acres (2,793 acres)	The development assumptions for this project are 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres. These assumptions are based on information in the Greater Uinta Basin Oil and Gas Cumulative Impacts Technical Support Document, 2012 (BLM 2012af). The source for the project boundary is the BLM Utah State Office (BLM 2012ac).
–	Vegetation Management ⁴	One portion in the southeastern corner of the Vernal Field Office; other portion 20 miles east of Manila, Utah	–	1,704 acres (1,704 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of vegetation management activities is unknown. The source for the project boundary is the BLM Vernal Field Office (BLM 2013k).
Ashley National Forest					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Manti-La Sal National Forest					
Meadow Fork Trail	Recreation	7 miles southeast of Spring City, Utah	–	2.4 miles (4 acres)	The development assumption for this project buffers the trail centerline to create a 15-foot-wide corridor. The assumption is based on an existing trail that part of the proposed trail follows. The source for the Project alignment is the Manti-La Sal National Forest (USFS 2011h).
Flat Canyon Coal Lease Tract	Coal mine	5 miles west of Clear Creek, Utah	U600	2,717 acres (2,717 acres)	The development assumption for this underground mine is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the Manti-La Sal National Forest, (USFS 2013e).
Shalom Fuels Project	Vegetation management ⁴	3 miles west of Clear Creek, Utah	U600	5,361 acres (5,361 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the extent of vegetation management activities is unknown. The source for the project boundary is the Manti-La Sal National Forest, (USFS 2012l).
Sunroc Corporation Chicken Creek Surface Gypsum Mine	Non-coal mine	2 miles east of Levan, Utah	–	18 acres (18 acres)	The development assumption for this surface mine is to consider the area within the project boundary as the development area since development at this point is unknown. The proposed access road assumption is the centerline buffered to a 25-foot width. The source for the project boundary is the Manti-La Sal National Forest, (USFS 2012j).
Uinta-Wasatch-Cache National Forest					
Squaw Creek Road Relocation Project	Highway/Road	Between Spanish Fork Road and Heber-Kamas Road	–	5 miles (12 acres)	The development assumption for this project is to buffer the road centerline for a 30-foot-wide corridor based on the portion of existing road alignment that the project follows (USFS 2012m). The source for the project alignment is the Uinta-Wasatch-Cache National Forest (USFS 2012n).

TABLE 4-2 REASONABLY FORESEEABLE FUTURE ACTIONS					
Applicant/Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Surface Disturbance)	Assumptions for Analysis ³
Utah Reclamation Mitigation and Conservation Commission and Bureau of Indian Affairs					
Bill Barrett Corporation Blacktail Ridge	Oil and/or gas development	In Duchesne County, 8 miles east of Fruitland, Utah, and 2 miles north of U.S. Highway 40	U421	933 acres (21 acres)	The development assumptions for this project are 3.5 acres of disturbance per well pad and a density of 1 well pad per 159 acres (5 wells on 790.52 acre parcel). These assumptions are based on information in the Blacktail Ridge 12-Well Exploratory Drilling Project EA Scoping Notice, November 2012 (Utah Reclamation Mitigation and Conservation Commission 2012). The source for the project boundary is Utah Reclamation Mitigation and Conservation Commission 2013c).
Bureau of Reclamation					
Bureau of Reclamation and Sanpete Water Conservancy District The Narrows Dam and Reservoir Project (including highway relocation, tunnel, and East Bench and Oak Creek Pipeline)	Dam and reservoir project	6 miles northeast of Fairview, Utah	U600 (Tunnel and Highway), U630, U636 (pipelines)	Reservoir: 669 acres Pipelines: 16 miles (59 acres) Highway: 3 miles (8 acres) Tunnel: 0.6 miles (2 acres) Dam: 0.3 acres	Reservoir: The development assumption for this project is based on using the entire project boundary since development at this point is unknown. The source for the project boundary is Central Utah Water Conservancy District, 2012. Pipelines: The development assumption is to buffer the pipelines for a 30-foot-wide corridor. Highway: The development assumption is to buffer the centerline for a 24-foot-wide corridor. Tunnel: The development assumption is to buffer the centerline for a 30-foot-wide corridor based on aerial imagery scar measurement of the current alignment. Dam: The development assumption is to buffer the dam point to 14,251 square feet. All of the development assumptions are based on information from the Narrows Project Final EIS, November 2012 (U.S. Bureau of Reclamation 2012). The source for the Project boundaries is Sanpete Water Conservancy District (Sanpete Water Conservancy District.2012).
State					
State of Utah School and Institutional Trust Lands Administration (SITLA)					
Santaquin Residential, Utah County South Price residential, Price Fairgrounds, Carbon County Arches Overlook, Grand County Johnsons Up On Top/Moab Golf Course College of Eastern Utah, Utah State University Branch Campus Site, Grand County Price Industrial, Carbon County Price City 40, Carbon County Price Industrial Large Lots Price Fairgrounds Exchange Parcel Green River Industrial	Multiple types of development ⁶	Throughout the Utah portion of the Project area	–	5,751 acres (5,751 acres)	The development assumption for this project is to use the entire project lease boundary since development in each lease or project area currently is unknown. The source for the project boundary is SITLA (SITLA 2013b).
Local					
Carbon County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
City of Helper					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Daggett County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Duchesne County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					

TABLE 4-2 REASONABLY FORESEEABLE FUTURE ACTIONS					
Applicant/Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Surface Disturbance)	Assumptions for Analysis ³
Emery County					
Blue Castle Nuclear Power Plant Project	Power generation	4 miles west-northwest of Green River, Utah	U488	1,030 acres (1,030 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is Emery County (Emery County 2009a).
–	Wind energy facilities	20 miles east of Castle Dale, Utah	–	3,838 acres (3,838 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is Emery County (Emery County 2009b).
Grand County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Juab County					
Juab County Loop Road	Highway/road	West of Mona, Utah	U640	3.8 miles (34 acres)	The development assumption for this project is to buffer the road centerline for a 75-foot-wide corridor based on the average road width for an interstate. This average was identified by EPG staff after measuring existing interstates. The source for the Project alignment is the BLM Fillmore Field Office (BLM 2012ax).
Nephi City					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Sanpete County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Uintah County					
Enefit American Oil shale development	Oil shale and/or tar sand development	In the Uinta Basin, south of Vernal, Utah	–	305 acres (305 acres)	The development assumption for this project is to use the entire project boundary since development at this point is unknown. The source for the project boundary is Stantec Corporation (Stantec Corporation 2012).
City of Naples					
Proposed Golf Course (private)	Recreation	2 miles east of Naples, Utah	–	433 acres (433 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the City of Naples (Naples City 2009a).
Proposed Heliport (private)	Air Facility	1.5 miles east of Naples, Utah	–	59 acres (59 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since development at this point is unknown. The source for the project boundary is the City of Naples (Naples City 2009b).
Utah County					
No actions have been identified or no data have been received to use in the cumulative effects analysis.					
Wasatch County					
Strawberry Highlands subdivision	Residential subdivision	30 miles west of Duchesne, Utah	–	1,906 acres (1,906 acres)	The development assumption for this project is to consider the area within the project boundary as the development area since the subdivision development at this point is unknown. The source for the project boundary is Wasatch County (Wasatch County 2012).

TABLE 4-2 REASONABLY FORESEEABLE FUTURE ACTIONS					
Applicant/Project Name	Type of Action	General Location ¹	Links Crossing the Action	Approximate Size of Action ² (Surface Disturbance)	Assumptions for Analysis ³
NOTES: ¹All locations are approximate unless township/range/section is provided. ²The acreage and mileage is calculated from the available data received from agencies or digitized maps. ³The assumptions were used in the quantification portion of the cumulative analysis to achieve an approximate amount of disturbance for each action. ⁴Vegetation management activities include but not are not limited to prescribed fires; chemical and mechanical weed treatments; mastication; mowing; bullhog; cut and pile; cut, pile, and burn; lop and scatter; plantings; chaining; stream channel work; shaded fuel breaks; etc. ⁵The development assumption for transmission lines is based on averaging corridor widths estimated by aerial interpretation for the following voltages: 500kV Transmission Lines: 225-foot-corridor 345kV Transmission Lines: 150-foot-corridor 230kV Transmission Lines: 100-foot-corridor 138kV Transmission Lines: 75-foot-corridor 115kV Transmission Lines: 50-foot-corridor ⁶SITLA Active Pre-Designation Leases include the following types of development: Residential, Recreation, School/Education Facility, Industrial, and Annexation. During the analysis, some known reasonably foreseeable future actions in the Project area were identified for which spatial data either have not been received from the field office or forest or were received after analysis began and will be added between the Draft and Final EIS. These reasonably foreseeable future actions include: - Multi-State Projects - LS Power and Wyoming Infrastructure Authority Wyoming-Colorado Intertie Transmission Project - High Plains Express Transmission Project - Jade Energy Associates Overland Transmission Project - Regional Watershed Supply Project Pipeline - Bureau of Land Management Rawlins Field Office - Catalina Plans of Development, G & I Proposed Atlantic Rim Natural Gas Wells - DKRW Facility and pipeline - Intermountain Wind (Boswell Springs) - Samson Endurance Northern Access Loop Pipeline - Bureau of Land Management Rock Springs Field Office - Miller Mountain Wind Farm - Bureau of Land Management Moab Field Office - Professor Valley Land and Water Conservation Fund Site Land Purchase - Bureau of Land Management Richfield Field Office - May 2013 Oil and Gas lease - Manti-La Sal National Forest - Graben Fuels - Mary’s Slide					

TABLE 4-3 SUMMARY APPROACH TO CUMULATIVE EFFECTS ANALYSIS					
Resource or Resource Issue	Issue(s) for Analysis	Cumulative Impact Analysis Area		Methods of Analysis	
		Geographic Scope	Temporal Scope	Quantitative	Qualitative
Climate and Air Quality	▪ What are the cumulative effects of the Project, other present and past projects, and reasonably foreseeable future actions (RFFA) on air quality?	Local airshed	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None	Assess nature and extent of cumulative effects associated with emissions during construction and operation phases of the of the Project, other present and past projects, and RFFAs
Geologic Hazards	▪ What are the impacts of the Project, other present and past projects, and RFFAs on areas with geological hazards?	The geographical extent of geologic hazards crossed by the 2-mile-wide alternative route study corridors	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs to assess potential effects on geologic hazards by (1) physiographic province and (2) areas of flooding and landslide susceptibility	None
Mineral Resources	▪ What are the impacts of the Project, other present and past projects, and RFFAs on existing land uses and future land uses (including minerals operations)?	2-mile-wide alternative route study corridors	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs to assess potential effects on mineral resources with regards to conflicting with the development of a mineral resource	None
Soil Resources	▪ What are the impacts of the Project, other present and past projects, and RFFAs on soils, including erosion on steep slopes as a potential result of ground disturbance?	The geographical extent of soil units crossed by 0.1 mile from either side of the reference centerline of alternative routes.	5 years for construction and stabilization; for operation and maintenance, will assume transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate the extent of development associated with the Project, other present and past projects, and RFFAs to assess potential impacts on areas of susceptible to flooding or landslides	None
Water Resources	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on: • surface water quality; • wetlands, riparian areas, and associated water quality; • other areas susceptible to erosion and potential for associated sediment deposition into water resources?	8-digit hydrologic unit code (HUC) (subbasin) drainage areas crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Assess cumulative impacts by alternative route	Assess potential cumulative impacts on water resources particularly valuable or susceptible to ground-disturbing activities (e.g., specially designated waters, wetlands and riparian areas, perennial systems) Assess potential cumulative impacts on areas with high potential for discharging erosion related sediment into water resources (i.e., areas particularly susceptible to erosion)
Vegetation	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on: • the spread of noxious weeds; and • wetland and riparian areas?	8-digit HUC (subbasin) drainage areas crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of potential cumulative loss of vegetation cover associated with the Project, other present and past projects, and RFFAs by community; existing vegetation cover by community estimated by summarizing Gap analysis Project data combined with recent fire boundaries (and incorporate other disturbance databases, if available)	Assess potential cumulative impacts on vegetation associated with the spread of noxious weeds
Special Status Plants	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on sensitive plant populations and potential habitats?	Areas of potentially suitable habitat and known populations in 8-digit HUC (subbasin) drainage areas crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in special status plant species population areas or potential habitats associated with the Project, other present and past projects, and RFFAs for species with available agency or modeled data	Assess potential cumulative impacts on special status plant species populations or potential habitats for species without available agency or modeled data

TABLE 4-3 SUMMARY APPROACH TO CUMULATIVE EFFECTS ANALYSIS					
Resource or Resource Issue	Issue(s) for Analysis	Cumulative Impact Analysis Area		Methods of Analysis	
		Geographic Scope	Temporal Scope	Quantitative	Qualitative
Wildlife	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on big game crucial and severe habitat and migratory bird species, including: anthropogenic development on migratory birds?	Big game: Areas of mapped crucial or seasonally important habitat in herd units (i.e., Hunt Units in Wyoming, Game Management Units in Colorado, and Herd Units in Utah) crossed by alternative routes Migratory birds: Vegetation communities in 8-digit HUC (subbasin) drainage areas crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in mapped big game habitat, including crucial (Utah and Wyoming) and severe (Colorado) big game habitat	Assess potential cumulative impacts on migratory birds
Special Status Wildlife	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on special status wildlife species, including: • loss of special status species habitat; and • long-term sustainability of populations?	Defined in collaboration with Biological Resources Task Group for each species or species group (Section 4.3.8)	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in special status species habitat (for species with available agency or modeled data)	Assess potential cumulative impacts on long-term sustainability of special status populations by species group (for species without available agency or modeled data)
Fish and Aquatic Resources	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on: • Federally listed threatened, endangered, proposed and candidate fish; • Bureau of Land Management, U.S. Forest Service, and state-listed special status fish and aquatic species; and • game fish and other aquatic organisms?	8-digit HUC (subbasin) drainage areas crossed by alternative routes	10 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None	Assess potential cumulative impacts on critical habitats or known locations of special status species effects from the Project, other present and past projects, and RFFAs within 1 mile upstream; resources are grouped by watershed in the discussion
Cultural Resources	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on: • archaeological and historic sites; • cultural resources dependent on visual settings (e.g., national historic trails); and • traditional cultural properties?	4-mile-wide study corridor (2 miles on either side of the reference centerline) as defined by Cultural Resources Task Group	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None. Effects on cultural resources are highly dependent on unknown site-specific conditions that may change substantially over time (i.e., site is destroyed through natural environmental processes; site is destroyed through human causes) and on unknown project-specific conditions (i.e., project engineering)	Assess potential cumulative effects on cultural resources, including the potential for effective mitigation
Paleontological Resources	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on paleontological resources?	Geographic extent of geological formations crossed by 2-mile-wide alternative route study corridors	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None	Assess cumulative ground disturbance by geologic formation
Visual Resources	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on: • scenery; and • views from residences and other viewing areas (e.g., travel routes, recreation areas, and special designations)?	Scenery: Scenic Quality Rating Units (SQRU) that would be fully or partially located within 3 miles of the alternative routes were considered Viewers: Defined by the agency-approved simulations locations that would have views of the Project and of the TransWest Express and/or Gateway West transmission projects, where the projects could be colocated	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Scenery: Estimate extent of development associated with the Project, other present and past projects, and RFFAs in each SQRU (total area of development in the SQRU and a percentage of the SQRU) Viewers: Illustrate potential cumulative impacts on viewers at 32 key observation points using visual simulations	Scenery: For key SQRUs, assess cumulative effects on landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modification as appropriate

TABLE 4-3 SUMMARY APPROACH TO CUMULATIVE EFFECTS ANALYSIS					
Resource or Resource Issue	Issue(s) for Analysis	Cumulative Impact Analysis Area		Methods of Analysis	
		Geographic Scope	Temporal Scope	Quantitative	Qualitative
Land Use Resources	- What conflicts does the Project, other present and past projects, and RFFAs pose with existing land uses or land management objectives (agricultural, recreational, conservation)? - What are the impacts of the Project, other present and past projects, and RFFAs on existing land uses and future lands uses (planned development)?	2-mile-wide alternative route study corridors	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate the extent of potential land use conflicts associated with the Project, other present and past projects, and RFFAs	None
Parks, Preservation, and Recreation	What are the impacts of the Project, other present and past projects, and RFFAs on recreational uses and areas?	Boundary of recreation resources crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate the extent of potential recreation resource or resource use conflicts associated with the Project, other present and past projects, and RFFAs	None
Transportation and Access	What are the impacts of the Project, other present and past projects, and RFFAs on airports and landing strips, roadways and railroads?	2-mile-wide alternative route study corridors	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate the extent of potential conflicts with transportation and access associated with the Project, other present and past projects, and RFFAs	None
Special Designations and Other Management Areas	What are the impacts of the Project, other present and past projects, and RFFAs on special designations?	Boundary of special designations or other management areas crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in special designations or other management areas potentially crossed by the Project	Evaluate potential cumulative effects on the relative or important values for which the area was designated
U.S. Forest Service Inventoried Roadless Areas (IRAs) and Unroaded/Undeveloped area	What are the impacts of the Project, other present and past projects, and RFFAs on IRAs and Unroaded/Undeveloped areas?	Boundary of IRA or Unroaded/Undeveloped area boundary crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in IRAs or Unroaded/Undeveloped areas potentially crossed by the Project	Evaluate potential cumulative impacts on wilderness characteristics and/or roadless character
Non-Wilderness Study Area Lands with Wilderness Characteristics	What are the impacts of the Project, other present and past projects, and RFFAs on inventoried non-wilderness study area lands with wilderness characteristics, natural areas, or non-wilderness study area lands with wilderness characteristics adopted into a BLM resource management plan?	Boundary of inventoried non-wilderness study area lands with wilderness characteristics, natural area, or non-wilderness study area lands with wilderness characteristics adopted into a BLM resource management plan crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in natural areas or non-wilderness study area lands with wilderness characteristics adopted into a BLM resource management plan potentially crossed by the Project	Evaluate potential cumulative impacts on wilderness criteria inventoried on non-wilderness study area lands with wilderness characteristics
Wildland and Fire Ecology Management	What contribution would the Project, other present and past projects, and RFFAs have to fire risk caused by ongoing human activities, and how does it contribute to the fire suppression challenges associated with an expanding wildland urban interface?	Project area	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None. Effects on fire ecology and management are highly dependent on unknown site-specific conditions that may change substantially in a single season, and unpredictable temporal conditions (e.g., weather).	Evaluate the potential for any type of ground disturbance associated with the Project, other present and past projects, and RFFAs to facilitate spread of invasive plants, change fire regime. Evaluate existing wildland urban interface and other transmission lines, and whether or not the Project could facilitate or constrain fire management

TABLE 4-3 SUMMARY APPROACH TO CUMULATIVE EFFECTS ANALYSIS					
Resource or Resource Issue	Issue(s) for Analysis	Cumulative Impact Analysis Area		Methods of Analysis	
		Geographic Scope	Temporal Scope	Quantitative	Qualitative
Social and Economic Conditions	▪ What are the impacts of the Project, other present and past projects, and RFFAs on local tourism in affected areas? ▪ What is the availability of employment for the local workforce during construction of the Project, other present and past projects, and RFFAs? ▪ Could the Project, other present and past projects, and RFFAs result in disparate impacts on low-income and/or disadvantaged populations? ▪ What are the impacts of Project, other present and past projects, and RFFAs on private property values? ▪ What are the impacts of Project, other present and past projects, and RFFAs on businesses and existing and future economic development?	Project area by county	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None	Evaluate possible cumulative effects on available workforce, employment, population, housing, and property values
Electric and Magnetic Fields	▪ What are the potential health effects of Project, other present and past projects, and RFFAs on humans and animals from electric and magnetic fields? ▪ Would Project, other present and past projects, and RFFAs cause interference with cellular phone, Internet, radio and/or television reception? ▪ What are other potential cumulative effects of the Project, other present and past projects, and RFFAs on occupational and public safety?	2-mile-wide study corridor where the Project is or could be adjacent to other extra-high voltage transmission lines	5 years for construction and stabilization; for operation and maintenance; assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None	Evaluate potential for disease or adverse effects from cumulative exposure to electric and magnetic fields and audible noise levels; evaluate potential cumulative effects on occupational health and safety

TABLE 4-4 DATA COMPONENTS OF EXISTING DEVELOPMENT BASE LAYER	
Dataset	Attributes
Two-mile-wide Alternative Route Study Corridors	
Existing Land Use Layer	Air facilities
	Agriculture
	Commercial
	Communication facilities
	Industrial
	Military
	Parks/Preservation
	Public/Quasi public
	Recreation
	Residential
	School/Educational facility
	Transportation (ground)
	Utilities
Utilities–Existing Transmission Lines	Utilities–transmission lines
Utilities–POWER Engineers Pipelines	Utilities–pipelines
ESRI StreetMap Roads™	Ground transportation–roads
Federal Railroad Administration–Railroads	Ground transportation–railroads
Two-mile-wide Alternative Route Study Corridors to the Largest Cumulative Impact Analysis Area	
LANDFIRE™	Agricultural
	Developed
	Recently disturbed
	Agricultural
Utilities–Existing Transmission Lines	Utilities–transmission lines
Utilities–POWER Engineers Pipelines	Utilities–pipelines
ESRI StreetMap Roads™	Ground transportation–roads
Federal Railroad Administration–Railroads	Ground transportation–railroads
Reference Centerlines of Alternative Routes to the Project Area Boundary	
Past and Present Activities	Coal mining
	Historical fires
	Industrial
	Military
	Mineral or other material mining
	Oil shale and/or tar sands

TABLE 4-4
DATA COMPONENTS OF EXISTING DEVELOPMENT BASE LAYER

Dataset	Attributes
Past and Present Activities	Oil and/or gas development
	Residential
	Sand and gravel mining
	Tar sands
	Vegetation management/Habitat improvement
	Vegetation management/Recreation improvement
	Wind-energy facility
NOTE: Other data layers are available in the existing land use and LANDFIRE™ datasets. Layers shown in this table have been selected to represent existing development. These layers include the following: Agriculture-Cultivated Crops and Irrigated Agriculture, Agriculture-Pasture and Hay, Developed-High Intensity, Developed-Medium Intensity, Developed-Roads, Developed-Upland Deciduous Forest, Developed-Upland Evergreen Forest, Developed-Upland Herbaceous, Developed-Upland Mixed Forest, Developed-Upland Shrubland, National Agricultural Statistics Service (NASS)-Close Grown Crop, NASS-Fallow/Idle Cropland, NASS-Orchard, NASS-Row Crop, NASS-Row Crop-Close Grown Crop, Quarries-Strip Mines-Gravel Pits, Recently Disturbed Developed Upland Deciduous Forest, Recently Disturbed Developed Upland Evergreen Forest, Recently Disturbed Developed Upland Herbaceous, Recently Disturbed Developed Upland Mixed Forest, Recently Disturbed Developed Upland Shrubland, Recently Disturbed Orchard Vegetation, and Recently Disturbed Pasture and Hayland. Additional LANDFIRE™ data types including Recently Burned Herbaceous Wetlands and Recently Burned-Herb and Grass Cover were not included to represent existing development. Existing transmission lines were compiled according to kilovolt (kV) capacity. Average corridor sizes were estimated by aerial interpretation: 500kV (225-foot-wide corridor); 345kV (150-foot-wide corridor); 230kV (100-foot-wide corridor); 138kV (75-foot-wide corridor); 115kV (50-foot-wide corridor). Pipelines were compiled according to data provided by POWER Engineers. Pipeline sizes vary from 6 inches to 42 inches in diameter. Average visible scar widths were estimated by aerial interpretation to develop average corridors for the following pipeline groups: 30- to 42-inch-diameter pipelines (300-foot-wide corridor); 20- to 26-inch-diameter (200-foot-wide corridor); 10- to 18-inch-diameter (100-foot-wide corridor); and 6- to 8.6-inch-diameter pipelines (50-foot-wide corridor). Roads are compiled according to road type. Average road corridor size was estimated by averaging the following road categories corridor widths using aerial interpretation: Interstate Highway (75-foot-wide corridor); Intra-State/Intra-Metropolitan Area/Inter-Metropolitan Area (50-foot-wide corridor); and City/County/Local (25-foot-wide corridor). Railroad corridors, based on aerial interpretation, were averaged to be 25-foot-wide.	

4.3 Cumulative Effects

4.3.1 Climate and Air Quality

The approach for analysis of cumulative effects on air quality, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.1) and considers them in conjunction with the past, present, and RFFAs listed in Tables 4-1 and 4-2.

4.3.1.1 Issues Identified for Analysis

Air pollutant emissions, including the major regulated criteria pollutants, GHGs, and lesser amounts of other regulated pollutants, such as hazardous air pollutants, would occur primarily during construction of the transmission line and series compensation stations. During the operations phase, emission sources would be limited to vehicular use for routine maintenance and emergency repair activities. The sources would be similar to those from construction, but pollutants would be emitted in much smaller amounts on an annual basis; therefore, the majority of emissions and impacts would be associated with construction. In addition, circuit breakers at the series compensation stations would release negligible amounts of SF₆, a GHG, due to leakage over time.

Construction of the transmission line and series compensation stations would release air pollutants from construction sources such as traffic, construction equipment, fugitive dust from earthmoving, etc. These emissions would combine with emissions from other existing local and regional sources of air pollutant to affect ambient concentrations of pollutants. The smaller amounts of pollution released during operation would combine with both existing and future emissions sources to affect ambient pollutant concentrations. GHGs released from Project sources would combined with global GHG emissions to affect climate change.

4.3.1.2 Existing Condition

Tables 3-2, 3-3, and 3-4 detail the current climate in the Project area. Tables 3-5, 3-6, and 3-7 detail the existing air quality.

Most of the area traversed by the alternative routes is in compliance with federal and state ambient air quality standards. The exception is Utah County, Utah, which would be traversed by portions of Alternatives COUT-A, COUT-B, and COUT-C and local route variations. The entire county is considered a nonattainment area with respect to the NAAQS for PM₁₀.

4.3.1.3 Results

Cumulative ambient effects from the construction phase of the Project and other existing sources of air pollutant emissions have been quantified in Appendix D. The background air-quality concentrations shown are indicative of impacts due to air pollutant emissions from existing sources.

Overall, impacts on air quality from construction would be temporary, localized to the vicinity of the activity, and would disperse or settle. The screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO₂ because of emissions from construction equipment used during transmission line and series compensation station construction (all other projected impacts were within standard limitations). However, current screening-level modeling methodology is inadequate to accurately characterize these impacts. Based on the conservative assumptions used in estimating the concentrations

and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO₂ resulting from Project construction would not be anticipated. In addition, the 1-hour NO₂ NAAQS is based on a 3-year average of sub-maximum concentrations. The activities resulting in maximum construction emissions would not occur in the same location for multiple years and the model only predicts maximum impacts, not the sub-maximum impacts that are the basis of the standard.

With respect to RFFAs, the likelihood of overlap with other development impacts is slight, because the proposed Project impacts would be temporary and localized. Emissions related to transmission line construction would affect different areas as the construction activity progresses, and series compensation station emissions would only affect the immediate area of the station (maximum impacts occur in a few hundred feet of the construction activities). In addition, transmission line or series compensation station construction emissions—such as dust or emissions from construction equipment that are emitted near ground level—do not produce measurable impacts at regional scales. Project-related traffic would represent a negligible portion of total traffic on public roads.

In addition, most of the reasonably foreseeable projects listed in Table 4-2 also would have air-quality impacts that are primarily related to their construction, rather than operation. This includes wind and solar projects, subdivisions, other transmission lines, pipelines, and substations. Impacts from such projects would be unlikely to overlap in time and space with construction emissions from the proposed Project because they would likewise be temporary and localized.

One activity that would occur with increasing frequency over portions of the Project area that could combine with transmission line and series compensation station construction emissions is oil and gas development. Southwestern Wyoming, northwestern Colorado, and northeastern Utah are all seeing increases in drilling and production. Both southwestern Wyoming and eastern Utah are currently being studied to determine the expected magnitude of emissions and impacts from these activities. Ambient impacts from oil and gas development will likely increase to some extent in future years as development occurs; however, recent EPA regulations on oil and gas production, as well as state-level regulations, are aimed at limiting these increases and preventing ambient standard violations or remedying any existing violations. Again, the localized and temporary nature of Project construction impacts would limit the opportunity for overlap of emissions and impacts.

With respect to GHGs, emissions from construction of the transmission line would range from 108 to 143 tons of CO₂e per mile of transmission line. Total emissions for the Applicant's Preferred Alternative (WYCO-B/COUT-H) would total approximately 50,000 tons of CO₂e over the 3 years of Project construction; other alternative routes would emit somewhat more due to longer transmission line distances. Construction of the two series compensation stations would emit an additional 3,000 tons CO₂e each. In contrast, the United States' energy-related CO₂ emissions totaled 6,215 million tons in 2010 (U.S. Energy Information Administration 2011a); energy related CO₂ constitutes approximately 80 percent of total U.S. man-made GHG emissions (U.S. Energy Information Administration 2011b). The maximum annual GHG emissions from Project construction would represent less than 0.001 percent of annual United States energy-related emissions, a minor additional contribution to cumulative emissions.

During operation of the series compensation stations, approximately 50 tons of CO₂e (as SF₆) would be emitted per year. This represents less than 0.000001 percent of annual energy-related emissions in the United States, a negligible amount.

Because GHG emissions from proposed projects contribute to climate change on a global scale, project-specific impacts of GHG emissions on the local environment cannot be quantified. The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts. Currently, BLM does not have an established mechanism to accurately predict the effect of resource management-level decisions from this project-specific effort on global climate change.

Although the Project would emit GHGs during construction, the emissions would be temporary, only occurring over a period of approximately 3 years. GHG emissions from operation of the series compensation stations would be negligible.

4.3.2 Earth Resources

The approaches for analysis of cumulative effects on geologic hazards, soil resources, and mineral resources including the geographic and temporal scopes defined for analysis, are presented in Table 4-3. These analyses rely on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.2) and considers them in conjunction with the past, present, and RFFAs listed in Tables 4-1 and 4-2.

4.3.2.1 Issues Identified for Analysis

4.3.2.1.1 Potential Impacts on Geologic Hazards

Potential cumulative effects on geologic hazards include landslide susceptibility resulting from the loss of vegetation or ground-disturbing activities related to the construction phase of multiple projects in a localized area. Also, mine subsidence could increase above subsurface mining activities in a localized area. Geologic hazards could directly and indirectly impact the construction, operation, and maintenance of the Project, either through direct loss of equipment or injury to personnel as a result of seismic activity, flooding, or landslides or indirect loss of transmission service as a result of these hazards. Cumulative effects of past, present and RFFAs are not expected to affect Quaternary faults or flooding.

4.3.2.1.2 Potential Impacts on Soil Resources

Cumulative effects on soil resources can result either from (1) alterations to the natural environment and land surface that could increase the rate of soil erosion by water or wind or (2) the permanent conversion of designated farmland soils to nonagricultural uses that could collectively result in limited loss of productivity of soils with the geographic scope for analysis. The implementation of appropriate selective mitigation measures would minimize short-term impacts, such as disturbance of surface soils and other alterations to the natural environment stemming from construction of the Project, other present and past projects, and RFFAs, such that the local soil resources would be stabilized or returned to a state close to their pre-construction state. Long-term impacts on soil resources would be associated with increased public access via new access roads to previously undisturbed areas crossed by the Project.

4.3.2.1.3 Potential Impacts on Existing Mineral Operations

Mineral resources are associated with the geologic formations or units they are found in. Not all geologic formations contain mineral resources or mineral resources may be found only in a portion of a geologic formation. The addition of the Project to past, present, and RFFAs could result in greater potential for effects on mineral resources throughout the Project area. The potential direct cumulative effects include ground disturbance, such as grading and cutting of access roads, auguring for tower footings and anchors, and conflicts with the development of mineral resources. Indirect effects include improved access to areas with mineral potential.

4.3.2.2 Existing Condition

4.3.2.2.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Geologic Hazards

Areas of potential mine subsidence are present along all of the WYCO alternative routes and are associated with underground coal mines crossed by the alternative routes. Quaternary faults are present, but rare, along all of the WYCO alternative routes. Areas with moderate potential for flooding are present

along all of the WYCO alternative routes along the rivers, streams, and drainages crossed by the alternative routes. Areas with high and moderate potential for landslides are present along all of the WYCO alternative routes and are most common in the steep areas crossed by the Project.

Soil Resources

Soils that are highly susceptible to water erosion are rare along the WYCO alternative routes and soils that are moderately susceptible occur intermittently along all of the alternative routes. Soils that are highly susceptible to wind erosion are rare along the WYCO alternative routes and soils that are moderately susceptible to wind erosion occur intermittently along all of the alternative routes. Designated Prime or Unique Farmland soils are present along all of the WYCO alternative routes and generally are restricted to valleys that are currently actively irrigated in Colorado.

Existing Mineral Operations

Active mines and producing wells are common along all of the WYCO alternative routes. Active mining claims are only present along Alternative WYCO-D and its route variation. Permitted mines are present along all of the WYCO alternative routes with the greatest past and present development along Alternative WYCO-D and its route variation. Coal and other leases are present along all of the WYCO alternative routes with the greatest past and present development along Alternative WYCO-D and its route variation. Oil and gas leases are present along all of the WYCO alternative routes with the greatest past and present development along Alternative WYCO-D and its route variation. There are no geothermal leases along the WYCO alternative routes.

4.3.2.2.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Geologic Hazards

Areas of potential mine subsidence are present along all of the COUT BAX alternative routes and are associated with underground coal mines crossed by the alternative routes. Quaternary faults are present, but rare, along all of the COUT BAX alternative routes. Areas with moderate potential for flooding are present along all of the COUT BAX alternative routes along the rivers, streams, and drainages crossed by the alternative routes. Areas with high and moderate potential for landslides are present along all of the COUT BAX alternative routes are most common in the mountainous areas of central Utah crossed by the Project.

Soil Resources

Soils that are highly susceptible to water erosion are most common in the mountainous areas of central Utah and soils that are moderately susceptible occur intermittently along all of the alternative routes. Soils that are highly susceptible to wind erosion are rare along the COUT BAX alternative routes and soils that are moderately susceptible to wind erosion occur intermittently along all of the alternative routes. Designated Prime or Unique Farmland soils are present along all of the COUT BAX alternative routes and generally are restricted to valleys that are currently actively irrigated.

Existing Mineral Operations

Active mines and producing wells are common along all of the COUT BAX alternative routes with the greatest past and present development along Alternative COUT BAX-E. Active mining claims and permitted mines are present, but rare, along all of the COUT BAX alternative routes. Coal and other leases are common along all of the COUT BAX alternative routes with the greatest past and present development along Alternatives COUT BAX-B and COUT BAX-C. Oil and gas leases are common along all of the COUT BAX alternative routes with the greatest past and present development along Alternatives COUT BAX-B and COUT BAX-C. One geothermal lease is present along Alternative COUT BAX-E.

4.3.2.2.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Geologic Hazards

Areas of potential mine subsidence are only present along Alternatives COUT-H and COUT-I. Quaternary faults are present, but rare, along all of the COUT alternative routes. Areas with moderate potential for flooding are present along all of the COUT alternative routes along the rivers, streams, and drainages crossed by the alternative routes. Areas with high and moderate potential for landslides are present along all of the COUT alternative routes are most common in the mountainous areas of central Utah crossed by the Project.

Soil Resources

Soils that are highly susceptible to water erosion are most common in the mountainous areas of central Utah and soils that are moderately susceptible occur intermittently along all of the alternative routes. Soils that are highly susceptible to wind erosion are rare along the COUT alternative routes and soils that are moderately susceptible to wind erosion occur intermittently along all of the alternative routes. Designated Prime or Unique Farmland soils are present along all of the COUT alternative routes and are generally restricted to valleys that are currently actively irrigated.

Existing Mineral Operations

Active mines and producing wells are present along all of the COUT alternative routes with the greatest past and present development along Alternatives COUT-H and COUT-I. Active mining claims are present only along Alternatives COUT-C and its route variations, COUT-H, and COUT-I. Permitted mines are present, but rare, along all of the COUT alternative routes. Coal and other leases are common along all of the COUT alternative routes but the greatest past and present development occur along Alternatives COUT-H and COUT-I. Oil and gas leases are common along all of the COUT alternative routes with the greatest past and present development along Alternative COUT-I. Geothermal leases are present, but rare, along Alternatives COUT-C and its route variations, COUT-H, and COUT-I.

4.3.2.3 Results

4.3.2.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes

Results of the analyses of cumulative effects from geologic hazards and on mineral and soil resources are summarized in Tables 4-5 through 4-23.

Geologic Hazards

The WYCO alternative routes do not cross any areas with Quaternary faults. The WYCO alternative routes cross areas with rare occurrences of potential mine subsidence. Cumulative effects from areas with potential mine subsidence on projects would only occur where other projects are sited in the immediate vicinity of the Project.

Soil Resources

Sensitive soils with moderate or high susceptibility to water or wind erosion, would experience the greatest cumulative effects along Alternative WYCO-D and WYCO-D-1; whereas, the least cumulative effects would occur along Alternative WYCO-B and its variants.

Past and present developments that would have cumulative effects on sensitive soils include historic fire perimeters from 2000 to 2012, BLM vegetation treatments in the Little Snake Field Office, BLM oil and gas units on the Price, Richfield, and Vernal Field Offices, oil and gas leases on Colorado and Utah state lands, the Chokecherry Wind Farm Expansion, and Seven Mile Hill Wind Energy Facility. RFFAs that

would have cumulative effects on sensitive soils include the Continental Divide-Creston Junction oil and gas project, the Gateway West 230kV and 500kV and TransWest Express transmission lines, and Hogback Ridge (Whirlwind I) Wind Energy Project.

TABLE 4-5 SOIL RESOURCES (SENSITIVE SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	26,200	1,600	1,900	2,800	6,300	19,900
WYCO-B-1	26,200	1,600	1,800	2,900	6,200	20,000
WYCO-B-2 (Agency Preferred Alternative)	26,200	1,600	1,900	2,800	6,300	19,900
WYCO-B-3	26,200	1,700	1,900	2,800	6,400	19,800
Alternative WYCO-C and Route Variations						
WYCO-C	27,000	2,700	2,600	2,600	8,000	19,000
WYCO-C-1	27,000	2,700	2,500	2,700	7,900	19,100
WYCO-C-2	26,900	2,700	2,600	2,600	7,900	19,000
WYCO-C-3	27,000	2,800	2,600	2,600	8,000	19,000
Alternative WYCO-D and Route Variation						
WYCO-D	32,000	3,900	3,000	2,700	9,600	22,400
WYCO-D-1	32,000	4,000	3,000	2,600	9,600	22,400
Alternative WYCO-F and Route Variations						
WYCO-F	28,000	1,600	2,900	2,900	7,400	20,600
WYCO-F-1	28,100	1,600	2,800	2,900	7,300	20,800
WYCO-F-2	28,000	1,600	2,900	2,900	7,300	20,700
WYCO-F-3	28,000	1,700	2,900	2,800	7,500	20,500
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Designated farmland soils would experience similar cumulative effects along all of the WYCO alternative routes and their variants.

Past and present developments that would have cumulative effects on designated farmland soils include historic fire perimeters from 2000 to 2012 and oil and gas fields. Reasonably foreseeable future action that would have cumulative effects on designated farmland soils includes the TransWest Express Transmission Project.

TABLE 4-6 SOIL RESOURCES (FARMLAND SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	16,300	1,200	400	200	1,800	14,500
WYCO-B-1	16,500	1,100	400	200	1,700	14,800
WYCO-B-2 (Agency Preferred Alternative)	15,800	1,300	400	200	1,800	14,000
WYCO-B-3	15,800	1,200	400	200	1,700	14,100
Alternative WYCO-C and Route Variations						
WYCO-C	16,300	1,200	400	200	1,800	14,500
WYCO-C-1	16,500	1,100	400	200	1,700	14,800
WYCO-C-2	15,800	1,300	400	200	1,800	14,000
WYCO-C-3	15,800	1,200	400	200	1,800	14,000
Alternative WYCO-D and Route Variation						
WYCO-D	30,200	7,200	500	200	7,800	22,400
WYCO-D-1	29,700	7,100	500	100	7,800	21,900
Alternative WYCO-F and Route Variations						
WYCO-F	16,300	1,200	400	200	1,800	14,500
WYCO-F-1	16,500	1,100	400	200	1,700	14,800
WYCO-F-2	15,800	1,300	400	200	1,800	14,000
WYCO-F-3	15,800	1,200	400	200	1,700	14,100
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Existing Mineral Operations

Active mining claims and producing wells are common along the WYCO alternative routes with concentrations in Wyoming. Cumulative effects on active mines and producing wells would be greatest along the similar Alternatives WYCO-B, WYCO-C, and WYCO-F, and would be the least along Alternative WYCO-D and WYCO-D-1.

Past and present development that would cumulatively affect active mines includes the Chokecherry Wind Farm Expansion, Sevenmile Hill Wind Energy Facility, oil and gas leases on Colorado and Wyoming state lands, and BLM oil and gas units on the White River and Little Snake Field Offices. RFFAs that would cumulatively affect active mines and producing wells include the Continental Divide-Creston Junction oil and gas project, the Gateway West and TransWest Express transmission projects, and the Hogback Ridge (Whirlwind I) Wind Energy Project.

TABLE 4-7 MINERAL RESOURCES (ACTIVE MINES AND PRODUCING WELLS) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	84,000	9,500	11,200	200	20,900	63,100
WYCO-B-1	84,000	9,500	11,200	200	20,900	63,100
WYCO-B-2 (Agency Preferred Alternative)	84,000	9,500	11,200	200	20,900	63,100
WYCO-B-3	84,000	9,500	11,200	200	20,900	63,100
Alternative WYCO-C and Route Variations						
WYCO-C	82,800	9,400	11,300	200	20,800	62,000
WYCO-C-1	82,800	9,400	11,300	200	20,800	62,000
WYCO-C-2	82,800	9,400	11,300	200	20,800	62,000
WYCO-C-3	82,800	9,400	11,300	200	20,800	62,000
Alternative WYCO-D and Route Variation						
WYCO-D	69,400	7,900	10,400	100	18,400	51,000
WYCO-D-1	69,400	7,900	10,400	100	18,400	51,000
Alternative WYCO-F and Route Variations						
WYCO-F	85,000	9,500	11,300	200	21,000	64,000
WYCO-F-1	85,000	9,500	11,300	200	21,000	64,000
WYCO-F-2	85,000	9,500	11,300	200	21,000	64,000
WYCO-F-3	85,000	9,500	11,300	200	21,000	64,000
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Active mining claims are only present along Alternative WYCO-D and Route Variation WYCO-D-1 and cumulative effects would be associated with reasonably foreseeable future projects.

TABLE 4-8 MINERAL RESOURCES (ACTIVE MINING CLAIMS) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-D and Route Variation						
WYCO-D	39	0	2	0	2	37
WYCO-D-1	39	0	2	0	2	37

Permitted mines occur infrequently along the WYCO alternative routes and would experience the greatest cumulative effect along Alternative WYCO-D and WYCO-D-1.

Past and present development that would have cumulative effects on permitted mines includes the Chokecherry Wind Farm Expansion and BLM oil and gas units on the White River and Little Snake Field Offices. RFFAs that would cumulatively affect permitted mines along the WYCO alternative routes would include the TransWest Express Transmission Project.

TABLE 4-9 MINERAL RESOURCES (PERMITTED MINES) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	130	12	0	0	12	118
WYCO-B-1	130	12	0	0	12	118
WYCO-B-2 (Agency Preferred Alternative)	130	12	0	0	12	118
WYCO-B-3	130	12	0	0	12	118
Alternative WYCO-C and Route Variations						
WYCO-C	208	24	7	0	31	177
WYCO-C-1	208	24	7	0	31	177
WYCO-C-2	208	24	7	0	31	177
WYCO-C-3	208	24	7	0	31	177
Alternative WYCO-D and Route Variation						
WYCO-D	1,200	300	7	4	300	900
WYCO-D-1	1,200	300	7	4	300	900
Alternative WYCO-F and Route Variations						
WYCO-F	182	15	1	0	17	165
WYCO-F-1	182	15	1	0	17	165
WYCO-F-2	182	15	1	0	17	165
WYCO-F-3	182	15	1	0	17	165
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Coal and other leases, including uranium, are present to varying degrees along the WYCO alternative routes. Cumulative effects would be greatest along Alternative WYCO-D and Route Variation WYCO-D-1 and would be least along Alternatives WYCO-B, WYCO-C, and WYCO-F and their route variations.

Past and present development that would have cumulative effects on coal or other leases include existing coal and uranium leases on Wyoming state lands, BLM oil and gas units on the White River and Little Snake Field Offices, oil and gas leases on Colorado and Wyoming state lands, and the Chokecherry Wind Farm Expansion. RFFAs that would have cumulative effects on coal and other leases include the Continental Divide-Creston Junction oil and gas project, the Gateway West and TransWest Express transmission projects, and the Hogback Ridge (Whirlwind I) Wind Energy Project.

TABLE 4-10 MINERAL RESOURCES (COAL AND OTHER LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	173,300	7,900	7,400	900	16,200	157,100
WYCO-B-1	173,300	7,900	7,400	900	16,200	157,100
WYCO-B-2 (Agency Preferred Alternative)	172,200	7,900	7,400	900	16,200	156,000
WYCO-B-3	173,300	7,900	7,400	900	16,200	157,100
Alternative WYCO-C and Route Variations						
WYCO-C	197,400	9,600	7,400	800	17,800	179,600
WYCO-C-1	197,400	9,600	7,400	800	17,800	179,600
WYCO-C-2	196,200	9,600	7,400	800	17,700	178,500
WYCO-C-3	197,400	9,600	7,400	800	17,800	179,600
Alternative WYCO-D and Route Variation						
WYCO-D	255,400	26,400	5,500	800	32,700	222,700
WYCO-D-1	255,400	26,400	5,500	800	32,700	222,700
Alternative WYCO-F and Route Variations						
WYCO-F	168,100	7,800	7,600	700	16,100	152,000
WYCO-F-1	168,100	7,800	7,600	700	16,100	152,000
WYCO-F-2	167,000	7,800	7,600	700	16,100	150,900
WYCO-F-3	168,100	7,800	7,600	700	16,100	152,000
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Oil and gas leases are present to varying degrees along the WYCO alternative routes. Cumulative effects would be greatest along Alternative WYCO-D and Route Variation WYCO-D-1 and would be least along Alternatives WYCO-B, WYCO-C, and WYCO-F and their route variations.

Past and present development that would have cumulative effects on oil and gas leases include existing coal leases on Wyoming state lands, oil and gas leases on Colorado and Wyoming state lands, BLM oil and gas units on the White River and Little Snake Field Offices, and the Chokecherry Wind Farm Expansion. RFFAs that would have cumulative effects on oil and gas leases include the Continental Divide-Creston Junction oil and gas project, the Gateway West and TransWest Express transmission projects, and the Hogback Ridge (Whirlwind I) Wind Energy Project.

TABLE 4-11 MINERAL LEASES (OIL AND GAS LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	49,300	3,200	1,700	400	5,200	44,100
WYCO-B-1	49,800	3,200	1,700	400	5,300	44,500
WYCO-B-2 (Agency Preferred Alternative)	49,200	3,100	1,700	300	5,200	44,000
WYCO-B-3	49,400	3,200	1,700	400	5,200	44,200
Alternative WYCO-C and Route Variations						
WYCO-C	49,200	3,200	1,800	400	5,300	43,900
WYCO-C-1	49,700	3,200	1,800	400	5,400	44,300
WYCO-C-2	49,100	3,100	1,800	400	5,300	43,800
WYCO-C-3	49,300	3,200	1,800	400	5,300	44,000
Alternative WYCO-D and Route Variation						
WYCO-D	61,600	8,900	1,300	400	10,500	51,100
WYCO-D-1	61,700	8,900	1,300	400	10,500	51,200
Alternative WYCO-F and Route Variations						
WYCO-F	51,100	3,300	1,700	400	5,400	45,700
WYCO-F-1	51,500	3,300	1,700	400	5,400	46,100
WYCO-F-2	51,000	3,300	1,800	300	5,400	45,600
WYCO-F-3	51,200	3,300	1,800	400	5,400	45,800
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Areas identified as having potential mineral resources are common along the WYCO alternative routes and would experience the greatest cumulative effect along Alternative WYCO-D and Route Variation WYCO-D-1.

TABLE 4-12 MINERAL RESOURCES (POTENTIAL MINERAL RESOURCE AREAS) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	116,100	8,400	8,100	1,300	17,800	98,300
WYCO-B-1	116,600	8,400	8,100	1,300	17,800	98,800
WYCO-B-2 (Agency Preferred Alternative)	114,300	8,200	8,100	1,300	17,600	96,700
WYCO-B-3	115,500	8,300	8,100	1,300	17,700	97,800
Alternative WYCO-C and Route Variations						
WYCO-C	124,300	9,700	9,200	1,200	20,200	104,100
WYCO-C-1	124,800	9,700	9,200	1,300	20,200	104,600
WYCO-C-2	122,500	9,500	9,200	1,200	20,000	102,500
WYCO-C-3	123,600	9,700	9,200	1,200	20,100	103,500
Alternative WYCO-D and Route Variation						
WYCO-D	172,000	26,400	6,900	1,500	34,800	137,200
WYCO-D-1	171,300	26,300	6,900	1,500	34,700	136,600
Alternative WYCO-F and Route Variations						
WYCO-F	133,200	9,500	9,500	1,400	20,300	112,900
WYCO-F-1	133,700	9,500	9,500	1,400	20,400	113,300
WYCO-F-2	131,400	9,300	9,500	1,400	20,100	111,300
WYCO-F-3	132,600	9,400	9,500	1,400	20,300	112,300
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

4.3.2.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes

Geologic Hazards

The COUT BAX alternatives cross nearly equal areas of Quaternary faults that would have potential cumulative effects on the Project and other projects. Areas with potential mine subsidence occur infrequently along the COUT BAX alternatives with the greatest potential along Alternative COUT BAX-E. Cumulative effects from either Quaternary faults or areas with potential mine subsidence on projects would occur only where other projects are sited immediately nearby to the Project.

Soil Resources

Sensitive soils occur along all of the COUT BAX alternative routes, and cumulative effects on sensitive soils would be greatest along Alternative COUT BAX-C and least along Alternative COUT BAX-B.

Past and present developments that cumulatively would affect sensitive soils include various mines, oil and gas wells on BLM lands in the Price, Richfield, and Vernal Field Offices, oil and gas wells on Utah state lands, oil shale leases on Utah state lands, and the Carbon County proposed ATV trail. RFFAs that

cumulatively would affect sensitive soils include the Kerr-McGee oil and gas development, the Narrows proposed East Bench and Oak Creek pipeline, and the TransWest Express Transmission Project.

TABLE 4-13 SOIL RESOURCES (SENSITIVE SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	34,900	5,300	2,900	3,200	11,400	23,500
COUT BAX-C	36,000	5,400	4,500	2,900	12,700	23,300
COUT BAX-E	36,600	5,300	4,200	3,000	12,500	24,100
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Designated Prime or Unique Farmland soils occur along all of the COUT BAX alternative routes and cumulative effects on designated Prime or Unique Farmland soils would be equal along all of the COUT BAX alternative routes.

Past and present developments that cumulatively would affect designated Prime or Unique Farmland soils include historic fire perimeters between 2000 and 2011, the Deserado Mine expansion, active sand and gravel permits in Utah, oil and gas leases on BLM land in the Price Field Office, Colorado state lands, and Utah state lands, the Ferron Natural Gas project, and the Carbon County proposed ATV trail. RFFAs that cumulatively would affect designated Prime or Unique Farmland soils would include Narrows proposed East Bend and Oak Creek pipeline, Mona South transmission line project, and the TransWest Express Transmission Project.

TABLE 4-14 SOIL RESOURCES (FARMLAND SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	29,200	4,900	700	300	6,000	23,200
COUT BAX-C	29,200	4,900	700	300	6,000	23,200
COUT BAX-E	32,200	4,900	800	300	6,000	26,200
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Existing Mineral Operations

Active mining claims and producing wells are common along the COUT BAX alternative routes with substantially greater numbers along Alternative COUT BAX-E relative to Alternatives COUT BAX-B and COUT BAX-C. Cumulative effects on active mines and producing wells would be greatest along Alternative COUT BAX-E.

Past and present development that cumulatively would affect active mines and producing wells includes the existing mines, metalliferous mineral, and potash leases on Utah state lands, BLM oil and gas units on the Grand Junction, Moab, Price, Richfield, Vernal, and White River Field Offices; Ferron natural gas

project, and the Enterprise Mid-America pipeline. RFFAs that cumulatively would affect active mines and producing wells include the TransWest Express Transmission Project.

TABLE 4-15 MINERAL RESOURCES (ACTIVE MINES AND PRODUCING WELLS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	31,400	16,500	400	100	17,100	14,300
COUT BAX-C	31,600	16,500	500	100	17,100	14,500
COUT BAX-E	69,300	46,200	900	100	47,300	22,000
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Active mining claims are present along the COUT BAX alternative routes with substantially greater numbers along Alternative COUT BAX-E relative to Alternatives COUT BAX-B and COUT BAX-C. Cumulative effects on active mines and producing wells would be greatest along Alternative COUT BAX-E.

Past and present development that cumulatively would affect active mining claims includes existing gravel pits and BLM oil and gas units. RFFAs that cumulatively would affect active mining claims include the TransWest Express Transmission Project.

TABLE 4-16 MINERAL RESOURCES (ACTIVE MINING CLAIMS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	600	55	36	21	100	500
COUT BAX-C	600	55	36	20	100	500
COUT BAX-E	1,600	64	49	45	200	1,400
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Permitted mines occur intermittently along the COUT BAX alternative routes. Cumulative effects on permitted mines along the COUT BAX alternative routes would be equal.

Past and present development that cumulatively would affect permitted mines along the COUT BAX alternative routes would include exiting gravel pits, BLM oil and gas units, various mines, the Ferron Natural Gas Project, and the Enterprise Mid-America Pipeline. There are no known RFFAs that would cumulatively affect permitted mines in the area of analysis.

TABLE 4-17 MINERAL RESOURCES (PERMITTED MINES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	500	78	0	0	100	400
COUT BAX-C	500	78	0	0	100	400
COUT BAX-E	500	63	0	0	100	400
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Coal and other leases occur frequently along the COUT BAX alternative routes. Cumulative effects on permitted mines along the COUT BAX alternative routes would be greatest along Alternative COUT BAX-C and least along Alternative COUT BAX-E.

Past and present developments that cumulatively would affect coal and other leases along the COUT BAX alternative routes would include existing mines and leases, BLM oil and gas units, the Ferron Natural Gas Project, Liberty Pioneer Gas Exploration project, Utah Department of Oil, Gas, and Mines oil and gas well pads, and the Enterprise Mid-America Pipeline. RFFAs that would cumulatively affect coal and other leases would include the Narrows proposed reservoir site, TransWest Express Transmission Project, and the Green River Industrial project.

TABLE 4-18 MINERAL RESOURCES (COAL AND OTHER LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	476,200	85,500	7,400	1,700	94,600	381,600
COUT BAX-C	482,300	85,500	15,300	1,600	102,400	379,900
COUT BAX-E	497,400	68,800	18,200	1,700	88,700	408,700
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Oil and gas leases occur frequently along the COUT BAX alternative routes. Cumulative effects would be greatest along Alternative COUT BAX-C, and would be least along Alternative COUT BAX-E.

Past and present developments that would have cumulative effects on oil and gas leases include the various existing oil and gas well pads on BLM and SITLA-administered lands, potash leases, the Ferron Natural Gas project, and the Enterprise Mid-America Pipeline. RFFAs that would be cumulative effects on oil and gas leases include the TransWest Express Transmission Project, the Green River Industrial project, the proposed Narrows reservoir, and the Woodside power generation project.

TABLE 4-19 MINERAL RESOURCES (OIL AND GAS LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	371,400	45,500	5,000	1,900	52,400	319,000
COUT BAX-C	380,300	46,600	21,300	1,800	69,600	310,700
COUT BAX-E	400,900	33,500	14,700	2,000	50,200	350,700
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Geothermal leases occur infrequently along the COUT BAX alternative routes and cumulative effects on geothermal leases would only occur along Alternative COUT BAX-E.

Currently, there are no past or present developments that would have cumulative effects on geothermal leases. RFFAs that cumulatively would affect geothermal leases would include the Woodside power generation project and the TransWest Express Transmission Project.

TABLE 4-20 MINERAL RESOURCES (GEOTHERMAL LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	26	0	0	0	0	26
COUT BAX-C	26	0	0	0	0	26
COUT BAX-E	78	1	27	0	28	50
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Potential mineral resource areas occur frequently along the COUT BAX alternative routes and cumulative effects would be greatest along Alternative COUT BAX-C.

TABLE 4-21 MINERAL RESOURCES (POTENTIAL MINERAL RESOURCE AREAS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	312,900	41,700	5,800	3,000	50,400	262,500
COUT BAX-C	325,900	41,900	18,500	2,700	63,000	262,900
COUT BAX-E	331,200	37,600	19,600	2,800	59,900	271,300
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

4.3.2.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes

Geologic Hazards

The COUT alternative routes cross nearly equal areas of Quaternary faults that would have potential cumulative effects on the Project and other projects. There are no areas with potential mine subsidence crossed by the COUT alternative routes. Cumulative effects from Quaternary faults on projects would occur only where other projects are sited in the immediate vicinity of the Project.

Soil Resources

The greatest cumulative effects on sensitive soils, moderate or high susceptibility to water or wind erosion, would occur along Alternative COUT-I and the least cumulative effects would occur along Alternative COUT-C and its variants.

Past and present developments that would have cumulative effects on sensitive soils include historic fire perimeters from 2000 to 2011, Roosevelt pipeline, BLM oil and gas units in the Vernal Field Office, oil and gas leases on Colorado state lands, and oil and gas leases and well pads on Utah state lands. RFFAs that would have cumulative effects on sensitive soils would include the Strawberry Highlands project and the TransWest Express Transmission Project.

TABLE 4-22 SOIL RESOURCES (SENSITIVE SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	24,500	5,000	2,400	2,200	9,700	14,800
COUT-A-1	24,400	5,000	2,400	2,200	9,600	14,800
Alternative COUT-B and Route Variations						
COUT-B	25,300	5,300	3,200	1,600	10,100	15,200
COUT-B-1	25,500	5,000	3,000	1,800	9,900	15,600
COUT-B-2	25,100	5,000	3,000	1,800	9,800	15,300
COUT-B-3	25,000	5,000	3,100	1,700	9,800	15,200
COUT-B-4	25,000	5,000	2,900	1,800	9,800	15,200
COUT-B-5	25,000	5,000	3,100	1,800	9,800	15,200
Alternative COUT-C and Route Variations						
COUT-C	23,500	4,600	2,800	1,700	9,200	14,300
COUT-C-1	23,400	4,600	2,600	1,900	9,100	14,300
COUT-C-2	23,000	4,600	2,500	1,900	9,000	14,000
COUT-C-3 (Agency Preferred Alternative)	23,000	4,600	2,600	1,900	9,100	13,900
COUT-C-4	22,800	4,300	2,200	2,100	8,700	14,100
COUT-C-5	22,800	4,300	2,300	2,000	8,600	14,200

TABLE 4-22 SOIL RESOURCES (SENSITIVE SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	22,500	5,600	2,500	1,200	9,400	13,100
COUT-I	27,500	6,200	2,000	2,200	10,400	17,100
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Designated Prime and Unique Farmland soils occur along the COUT alternative routes, and would experience the greatest cumulative effects along Alternative COUT-B, and its variants; whereas, the least cumulative effects would occur along Alternative COUT-C, and its variants.

Past and present developments that would have cumulative effects on designated Prime and Unique Farmland soils would include historic fire perimeters between 2000 and 2011, BLM oil and gas units in the Vernal and Price Field Offices, oil and gas leases on Colorado state lands, and oil and gas leases and well pads on Utah state lands. RFFAs that would have cumulative effects on designated Prime and Unique Farmland soils would include the Narrows proposed East Bench and Oak Creek pipeline, Mona South transmission line project, and TransWest Express Transmission Project.

TABLE 4-23 SOILS RESOURCES (FARMLAND SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	19,400	5,700	400	100	6,200	13,200
COUT-A-1	19,400	5,700	400	100	6,200	13,200
Alternative COUT-B and Route Variations						
COUT-B	21,300	6,900	500	100	7,400	13,900
COUT-B-1	21,300	6,900	500	100	7,400	13,900
COUT-B-2	21,300	6,900	500	100	7,400	13,900
COUT-B-3	21,300	6,900	500	100	7,400	13,900
COUT-B-4	21,300	6,900	500	100	7,400	13,900
COUT-B-5	21,300	6,900	500	100	7,400	13,900

TABLE 4-23 SOILS RESOURCES (FARMLAND SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	9,600	2,600	200	100	2,900	6,700
COUT-C-1	8,700	2,500	200	100	2,800	5,900
COUT-C-2	8,700	2,500	200	100	2,800	5,900
COUT-C-3 (Agency Preferred Alternative)	8,700	2,500	200	100	2,800	5,900
COUT-C-4	9,600	2,600	200	100	2,900	6,700
COUT-C-5	9,600	2,600	200	100	2,900	6,700
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	13,900	3,800	300	100	4,200	9,700
COUT-I	12,600	2,900	300	200	3,400	9,200
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Existing Mineral Operations

Active mines and producing wells occur to varying degrees along the COUT alternative routes. Cumulative effects on active mines and producing wells would be the greatest along Alternatives COUT-H and COUT-I.

Past and present developments that cumulatively would affect active mines and producing wells include existing mines, oil and gas units in the BLM Vernal Field Office, oil and gas leases or well pads on Utah state lands, and the Roosevelt pipeline. RFFAs that cumulatively would affect active mines and producing wells would include the Blacktail Ridge exploratory drilling project and the TransWest Express Transmission Project.

TABLE 4-24 MINERAL RESOURCES (ACTIVE MINES AND PRODUCING WELLS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	32,500	17,500	300	100	17,900	14,600
COUT-A-1	32,500	17,500	300	100	17,900	14,600

TABLE 4-24 MINERAL RESOURCES (ACTIVE MINES AND PRODUCING WELLS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-B and Route Variations						
COUT-B	33,500	17,400	300	100	17,800	15,700
COUT-B-1	32,600	16,900	300	100	17,300	15,300
COUT-B-2	32,600	16,900	300	100	17,300	15,300
COUT-B-3	32,500	16,900	300	100	17,300	15,200
COUT-B-4	32,600	16,900	300	100	17,300	15,300
COUT-B-5	32,500	16,900	300	100	17,300	15,200
Alternative COUT-C and Route Variations						
COUT-C	51,300	25,000	600	100	25,700	25,600
COUT-C-1	50,300	24,500	600	100	25,200	25,100
COUT-C-2	50,300	24,500	600	100	25,200	25,100
COUT-C-3 (Agency Preferred Alternative)	50,300	24,500	600	100	25,200	25,100
COUT-C-4	50,400	24,500	600	100	25,200	25,200
COUT-C-5	50,400	24,500	600	100	25,200	25,200
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	93,800	38,200	1,200	100	39,500	54,300
COUT-I	72,200	39,500	700	200	40,400	31,800
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Active mining claims occur equally along Alternatives COUT-C, COUT-H, and COUT-I.

Past and present developments that cumulatively would affect active mining claims would include special active mineral permits, metalliferous mineral leases, and oil and gas leases on Utah state lands and BLM oil and gas units in the Vernal Field Office. RFFAs that cumulatively would affect active mining claims would include the TransWest Express Transmission Project.

TABLE 4-25 MINERAL RESOURCES (ACTIVE MINING CLAIMS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	0	0	0	0	0	0
COUT-A-1	0	0	0	0	0	0

TABLE 4-25 MINERAL RESOURCES (ACTIVE MINING CLAIMS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-B and Route Variations						
COUT-B	0	0	0	0	0	0
COUT-B-1	0	0	0	0	0	0
COUT-B-2	0	0	0	0	0	0
COUT-B-3	0	0	0	0	0	0
COUT-B-4	0	0	0	0	0	0
COUT-B-5	0	0	0	0	0	0
Alternative COUT-C and Route Variations						
COUT-C	25,700	2,500	100	13	2,600	23,100
COUT-C-1	25,700	2,500	100	13	2,600	23,100
COUT-C-2	25,700	2,500	100	13	2,600	23,100
COUT-C-3 (Agency Preferred Alternative)	25,700	2,500	100	13	2,600	23,100
COUT-C-4	25,700	2,500	100	13	2,600	23,100
COUT-C-5	25,700	2,500	100	13	2,600	23,100
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	25,700	2,500	100	13	2,600	23,100
COUT-I	26,200	2,500	100	18	2,600	23,600
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Permitted mines occur infrequently along the COUT alternative routes and Alternatives COUT-H and COUT-I would have the greatest cumulative effects.

Past and present developments that cumulatively would affect permitted mines along the COUT alternative routes include oil and gas leases on Utah state lands, BLM oil and gas units in the Price Field Office, and the Ferron Natural Gas project. RFFAs that cumulatively would affect permitted mines would include the TransWest Express Transmission Project.

TABLE 4-26 MINERAL RESOURCES (PERMITTED MINES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	52	12	0	0	12	40
COUT-A-1	52	12	0	0	12	40
Alternative COUT-B and Route Variations						
COUT-B	100	15	0	0	15	85
COUT-B-1	52	12	0	0	12	40
COUT-B-2	52	12	0	0	12	40
COUT-B-3	78	15	0	0	15	63
COUT-B-4	52	12	0	0	12	40
COUT-B-5	78	15	0	0	15	63
Alternative COUT-C and Route Variations						
COUT-C	100	15	0	0	15	85
COUT-C-1	52	12	0	0	12	40
COUT-C-2	52	12	0	0	12	40
COUT-C-3 (Agency Preferred Alternative)	78	15	0	0	15	63
COUT-C-4	52	12	0	0	12	40
COUT-C-5	78	15	0	0	15	63
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	100	17	7	0	24	76
COUT-I	78	28	0	0	28	50
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Coal and other leases would occur frequently along the COUT alternative routes and Alternative COUT-I would have the greatest cumulative effects.

Past and present developments that would have cumulative effects on coal and other leases would include various mines; BLM oil and gas units in the Vernal Field Office; oil and gas leases on Colorado state lands; and oil and gas leases, well pads, metalliferous mineral leases, and active mineral material permits on Utah state lands. RFFAs that cumulatively would affect coal and other leases would include the TransWest Express Transmission Project, Kerr-McGee oil and gas development project, and the Narrows proposed reservoir.

TABLE 4-27 MINERAL RESOURCES (COAL AND OTHER LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	167,400	28,800	2,600	700	32,200	135,200
COUT-A-1	167,400	28,800	2,600	700	32,200	135,200
Alternative COUT-B and Route Variations						
COUT-B	213,500	37,300	2,200	500	40,100	173,400
COUT-B-1	209,600	37,200	2,100	500	39,900	169,700
COUT-B-2	209,600	37,200	2,100	500	39,900	169,700
COUT-B-3	209,600	37,200	2,100	500	39,900	169,700
COUT-B-4	209,600	37,200	2,100	500	39,900	169,700
COUT-B-5	209,600	37,200	2,100	600	39,900	169,700
Alternative COUT-C and Route Variations						
COUT-C	403,100	72,700	4,200	1,000	77,900	325,200
COUT-C-1	403,800	75,800	4,200	1,000	81,000	322,800
COUT-C-2	403,800	75,800	4,200	1,000	81,000	322,800
COUT-C-3 (Agency Preferred Alternative)	403,800	75,800	4,200	1,000	81,000	322,800
COUT-C-4	399,200	72,600	4,200	1,000	77,800	321,400
COUT-C-5	399,200	72,600	4,200	1,000	77,700	321,500
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	528,300	103,000	16,500	900	120,500	407,800
COUT-I	643,000	139,800	9,200	1,500	150,600	492,400
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Oil and gas leases occur frequently along the COUT alternative routes. Alternative COUT-I would have the greatest cumulative effects and Alternative COUT-A and Route Variation COUT-A-1 would have the least.

Past and present developments that would have cumulative effects on oil and gas leases include various mines, Roosevelt pipeline; BLM oil and gas units in the Vernal, Price, and Richfield Field Offices; oil and gas leases on Colorado state lands; and oil and gas leases and well pads on Utah state lands; and metalliferous mineral on Utah state lands. RFFAs that cumulatively would affect oil and gas leases would include the TransWest Express Transmission Project, and the Kerr-McGee oil and gas development.

TABLE 4-28 MINERAL RESOURCES (OIL AND GAS LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	167,400	20,100	3,000	800	23,900	143,500
COUT-A-1	167,400	20,100	3,000	800	23,900	143,500
Alternative COUT-B and Route Variations						
COUT-B	199,200	31,000	3,300	700	35,000	164,200
COUT-B-1	191,000	30,800	3,000	700	34,600	156,400
COUT-B-2	193,000	30,900	3,200	700	34,800	158,200
COUT-B-3	193,100	30,500	3,400	700	34,600	158,500
COUT-B-4	193,600	31,000	3,200	700	34,900	158,700
COUT-B-5	192,500	30,500	3,300	700	34,500	158,000
Alternative COUT-C and Route Variations						
COUT-C	277,400	41,400	4,500	1,000	46,900	230,500
COUT-C-1	278,400	46,800	4,400	1,100	52,400	226,000
COUT-C-2	280,400	46,900	4,600	1,100	52,600	227,800
COUT-C-3 (Agency Preferred Alternative)	279,900	46,500	4,700	1,100	52,300	227,600
COUT-C-4	277,100	42,100	4,300	1,200	47,700	229,400
COUT-C-5	276,500	41,700	4,500	1,200	47,300	229,200
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	262,800	39,400	4,200	800	44,500	218,300
COUT-I	370,000	63,700	4,600	1,600	70,000	300,000
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Geothermal leases occur rarely along the COUT alternative routes and Alternative COUT-C, and its variants, Alternatives COUT-H, and COUT-I would have the greatest cumulative effect. No cumulative effects on geothermal leases would occur along Alternatives COUT-B and COUT-C.

Past and present development that would have cumulative effects on geothermal leases would include oil and gas leases and well pads and oil shale leases on Utah state lands. The RFFA that would have cumulative effects on geothermal leases include the Kerr-McGee oil and gas development project.

TABLE 4-29 MINERAL RESOURCE (GEOTHERMAL LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	26	0	0	0	0	26
COUT-A-1	26	0	0	0	0	26
Alternative COUT-B and Route Variations						
COUT-B	26	0	0	0	0	26
COUT-B-1	26	0	0	0	0	26
COUT-B-2	26	0	0	0	0	26
COUT-B-3	26	0	0	0	0	26
COUT-B-4	26	0	0	0	0	26
COUT-B-5	26	0	0	0	0	26
Alternative COUT-C and Route Variations						
COUT-C	52	14	0	0	14	38
COUT-C-1	52	14	0	0	14	38
COUT-C-2	52	14	0	0	14	38
COUT-C-3 (Agency Preferred Alternative)	52	14	0	0	14	38
COUT-C-4	52	14	0	0	14	38
COUT-C-5	52	14	0	0	14	38
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	52	14	0	0	14	38
COUT-I	104	14	0	1	15	89
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Areas identified as having potential mineral resources are common along the COUT alternative routes and Alternative COUT-I would have the greatest cumulative effect.

TABLE 4-30 MINERAL RESOURCES (POTENTIAL MINERAL RESOURCE AREAS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	224,900	49,300	7,100	2,000	58,400	166,500
COUT-A-1	224,400	49,300	7,100	2,000	58,400	166,000

TABLE 4-30 MINERAL RESOURCES (POTENTIAL MINERAL RESOURCE AREAS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-B and Route Variations						
COUT-B	237,800	49,000	5,400	1,200	55,600	182,200
COUT-B-1	233,400	47,800	5,300	1,400	54,500	178,900
COUT-B-2	235,300	47,700	5,500	1,500	54,600	180,700
COUT-B-3	235,000	47,700	5,400	1,400	54,500	180,500
COUT-B-4	235,300	47,700	5,500	1,500	54,700	180,600
COUT-B-5	235,100	47,700	5,400	1,400	54,500	180,600
Alternative COUT-C and Route Variations						
WYCO-C	229,900	40,400	4,600	1,500	46,400	183,500
COUT-C-1	225,400	42,200	4,600	1,700	48,500	176,900
COUT-C-2	227,200	42,200	4,700	1,700	48,600	178,600
COUT-C-3 (Agency Preferred Alternative)	226,900	42,200	4,600	1,600	48,400	178,500
COUT-C-4	227,400	39,200	4,400	2,000	45,600	181,800
COUT-C-5	227,000	39,100	4,400	1,800	45,300	181,700
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	228,000	43,900	5,600	1,300	50,700	177,300
COUT-I	273,100	54,300	4,700	2,200	61,000	212,100
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

4.3.3 Paleontological Resources

The approach for analysis of cumulative effects on paleontological resources, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.3) and considers them in conjunction with the past, present, RFFAs listed in Tables 4-1 and 4-2.

4.3.3.1 Potential Impacts on Paleontological Resources

Paleontological resources can be affected directly by disturbance or destruction of buried, in-situ fossils as a result of ground-disturbing activities including, access road creation, leveling of transmission tower sites, pipeline trenching, or mine excavation. Indirect impacts on paleontological resources include increased potential for vandalism or unauthorized collection of fossils due to increased public access into previously difficult to access areas.

4.3.3.2 Existing Condition

Numerous geologic units are present in the CIAA for the Project containing moderate to very high PFYCs (PFYCs 3, 4 and 5). These geologic units range from small exposed areas to very large areas encompassing several states. These geologic units are known to have contained paleontological resources in the past.

The geologic units and their PFYC classifications, crossed by the WYCO alternative routes are shown in Table 4-31.

TABLE 4-31 GEOLOGICAL UNITS CROSSED BY THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES		
Alternative Route	Geological Formations with a Potential Fossil Yield Classification of 4 or 5 (High Sensitivity)	Geological Formations with a Potential Fossil Yield Classification of 3 (Moderate Sensitivity)
Alternative WYCO-B and Route Variations		
WYCO-B (Applicant Preferred Alternative)	Wasatch Formation, Luman Tongue (Green River Formation), Tipton Shale (Green River Formation), Laney Member (Green River Formation), Cathedral Bluffs Tongue (Wasatch Formation), Niobrara Formation, Ferris Formation, Hanna Formation, Mesaverde Group, Lance Formation, Bridger Formation, Browns Park Formation, Iles Formation	Steele Shale, Lewis Shale, Fort Union Formation, Medicine Bow Formation, Miocene Rocks, Mancos, Sego Sandstone/Buck Tongue
WYCO-B-1	Same as WYCO-B	Same as WYCO-B
WYCO-B-2 (Agency Preferred Alternative)	Same as WYCO-B	Same as WYCO-B
WYCO-B-3	Same as WYCO-B	Same as WYCO-B
Alternative WYCO-C and Route Variations		
WYCO-C	Wasatch Formation, Luman Tongue (Green River Formation), Tipton Shale (Green River Formation), Wilkins Peak Member (Green River Formation), Cathedral Bluffs Tongue (Wasatch Formation), Niobrara Formation, Hanna Formation, Ferris Formation, Laney Member (Green River Formation), Washakie Formation, Mesaverde Group, Lance Formation, Bridger Formation, Browns Park, Iles Formation	Steele Shale, Lewis Shale, Fort Union Formation, Medicine Bow Formation, Miocene Rocks, Sego Sandstone/Buck Tongue, Mancos
WYCO-C-1	Same as WYCO-C	Same as WYCO-C
WYCO-C-2	Same as WYCO-C	Same as WYCO-C
WYCO-C-3	Same as WYCO-C	Same as WYCO-C

TABLE 4-31 GEOLOGICAL UNITS CROSSED BY THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES		
Alternative Route	Geological Formations with a Potential Fossil Yield Classification of 4 or 5 (High Sensitivity)	Geological Formations with a Potential Fossil Yield Classification of 3 (Moderate Sensitivity)
Alternative WYCO-D and Route Variation		
WYCO-D	Ferris Formation, Tipton Shale (Green River Formation), Hanna Formation, Lance Formation, Mesaverde Group, Niobrara Formation, Wasatch Formation, Cathedral Bluffs Tongue (Wasatch Formation), Browns Park Formation, Iles Formation, Williams Fork Formation	Fort Union Formation, Lewis Shale, Medicine Bow Formation, Miocene Rocks, Steele Shale, Laramie Formation, Madison Limestone, Mancos, Sego Sandstone/Buck Tongue
WYCO-D-1	Same as WYCO-D	Same as WYCO-D
Alternative WYCO-F and Route Variations		
WYCO-F	Ferris Formation, Luman Tongue (Green River), Tipton Shale (Green River), Hanna Formation, Lance Formation, Mesaverde Group, Niobrara Formation, Wasatch Formation, Cathedral Bluffs Tongue (Wasatch Formation), Bridger Formation, Browns Park Formation, Laney Member (Green River Formation), Iles Formation	Fort Union Formation, Lewis Shale, Medicine Formation, Miocene Rocks, Steele Shale, Mancos, Sego Sandstone/Buck Tongue
WYCO-F-1	Same as WYCO-F	Same as WYCO-F
WYCO-F-2	Same as WYCO-F	Same as WYCO-F
WYCO-F-3	Same as WYCO-F	Same as WYCO-F

The geologic units and their PFYC ratings, crossed by the COUT BAX alternative routes are shown in Table 4-32.

TABLE 4-32 GEOLOGICAL UNITS CROSSED BY THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES		
Alternative Route	Geological Formations with a Potential Fossil Yield Classification of 4 or 5 (High Sensitivity)	Geological Formations with a Potential Fossil Yield Classification of 3 (Moderate Sensitivity)
COUT BAX-B	Dakota Sandstone and Burro Canyon Formations, Green River, Iles Formation, Mesaverde Group, Wasatch Formation, Williams Fork Formation, Duchesne River Formation, Morrison Formation, North Horn Formation	Hunter Canyon, Mancos, Mt. Garfield Formation and Sego Sandstone, Sego Sandstone/Buck Tongue, Arapien Shale and Summerville Formation, Glen Canyon Group, Indianola Formation
COUT BAX-C	Same as COUT BAX-B	Same as COUT BAX-B
COUT BAX-E	Same as COUT BAX-B	Same as COUT BAX-B

The geologic units and their PFYC ratings, crossed by the COUT alternative routes are shown in Table 4-33.

TABLE 4-33 GEOLOGICAL UNITS CROSSED BY THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES		
Alternative Route	Geological Formations with a Potential Fossil Yield Classification of 4 or 5 (High Sensitivity)	Geological Formations with a Potential Fossil Yield Classification of 3 (Moderate Sensitivity)
Alternative COUT-A and Route Variation		
COUT-A	Mesaverde Group, Duchesne River Formation, Green River Formation, North Horn Formation, Wasatch Formation	Mancos, Sego Sandstone/Buck Tongue, Arapien Shale, Summerville Formation, Indianola Formation
COUT-A-1	Same as COUT-A	Same as COUT-A
Alternative COUT-B and Route Variations		
COUT-B	Same as COUT-A	Same as COUT-A
COUT-B-1	Same as COUT-A	Same as COUT-A
COUT-B-2	Same as COUT-A	Same as COUT-A
COUT-B-3	Same as COUT-A	Same as COUT-A
COUT-B-4	Same as COUT-A	Same as COUT-A
COUT-B-5	Same as COUT-A	Same as COUT-A
Alternative COUT-C and Route Variations		
COUT-C	Same as COUT-A	Same as COUT-A
COUT-C-1	Same as COUT-A	Same as COUT-A
COUT-C-2	Same as COUT-A	Same as COUT-A
COUT-C-3 (Agency Preferred Alternative)	Same as COUT-A	Same as COUT-A
COUT-C-4	Same as COUT-A	Same as COUT-A
COUT-C-5	Same as COUT-A	Same as COUT-A
Alternatives COUT-H and COUT-I		
COUT-H (Applicant Preferred Alternative)	Same as COUT-A	Same as COUT-A
COUT-I	Same as COUT-A	Same as COUT-A

4.3.3.3 Results

4.3.3.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

The WYCO alternative routes share alignments along Links W15, W30, W32, W35, W36, and C175. The impacts from the Project would contribute cumulatively to the impacts of other present and past projects, and RFFAs on those geologic units with moderate or high sensitivity. However, application of design features of the Proposed Action, including preconstruction surveys for paleontological resources, would be anticipated to minimize the incremental effects.

Projects that could have cumulative effects associated with the implementation of the Project, for the WYCO alternative routes, are shown in Table 4-34.

TABLE 4-34 PAST, PRESENT, AND OTHER REASONABLY FORESEEABLE FUTURE ACTIONS FOR PALEONTOLOGICAL RESOURCES IN THE CUMULATIVE IMPACTS ANALYSIS AREA OF THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES		
Alternative Route	Past and Present Actions	Reasonably Foreseeable Future Actions
Alternative WYCO-B and Route Variations		
WYCO-B (Applicant Preferred Alternative)	Chokecherry and Sierra Madre Wind Farm, Anadarko Atlantic Rim Natural Gas Project, PacifiCorp Seven Mile Hill Wind Energy Facility, Bureau of Land Management Oil and Gas Leases, Carl Allen 45, Colorado State Oil and Gas Leases, Wyoming State Oil and Gas Leases, Wyoming State Land Uranium Lease	Continental Divide-Creston Junction Oil and Gas Project, Gateway West 500kV, TransWest Express Transmission Project, Hogback Ridge Wind Energy Project
WYCO-B-1	Same as WYCO-B	Same as WYCO-B
WYCO-B-2 (Agency Preferred Alternative)	Same as WYCO-B	Same as WYCO-B
WYCO-B-3	Same as WYCO-B	Same as WYCO-B
Alternative WYCO-B and Route Variations		
WYCO-C	Same as WYCO-B	Same as WYCO-B
WYCO-C-1	Same as WYCO-B	Same as WYCO-B
WYCO-C-2	Same as WYCO-B	Same as WYCO-B
WYVO-C-3	Same as WYCO-B	Same as WYCO-B
Alternative WYCO-B and Route Variations		
WYCO-D	Same as WYCO-B excluding Carl Allen 45	Same as WYCO-B, but with the addition of Trapper Mine Exploratory Coal Mine, and SWEPI LP Oil and Gas Development
WYCO-D-1	Same as WYCO-B excluding Carl Allen 45	Same as WYCO-B, but with the addition of Trapper Mine Exploratory Coal Mine, and SWEPI LP Oil and Gas Development
Alternative WYCO-B and Route Variations		
WYCO-F	Same as WYCO-B	Same as WYCO-B
WYCO-F-1	Same as WYCO-B	Same as WYCO-B
WYCO-F-2	Same as WYCO-B	Same as WYCO-B
WYCO-F-3	Same as WYCO-B	Same as WYCO-B

For the WYCO alternative routes and route variations, development associated with several large past and present actions have contributed to cumulative impacts on paleontological resources, including the Chokecherry and Sierra Madre Wind Farm and oil and gas development on BLM-administered land. In addition to Project impacts, RFFAs, such as the TransWest Express Transmission Project, if implemented would add to the cumulative effects on paleontological resources. For the WYCO alternative routes, the extent of cumulative development would be the same because the same past and other present actions and RFFAs occur in the CIAA, with the exception of the Trapper Exploratory Coal Mine and SWEPI LP Oil and Gas Development, which are exclusive to Alternative WYCO-D and Route Variation WYCO-D-1. Also, Carl Allen 45 oil and gas development would be excluded from cumulative effects associated with Alternative WYCO-D and Route Variation WYCO-D-1. Overall, the cumulative effects associated with the Project along any of the WYCO alternative routes would be similar. Application of selective mitigation measures, including preconstruction surveys for paleontological resources, is anticipated to minimize the incremental Project effects.

4.3.3.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Projects that could have cumulative effects associated with the implementation of the Project, for the COUT BAX alternative routes, are shown in Table 4-35.

TABLE 4-35 PAST, PRESENT, AND OTHER REASONABLY FORESEEABLE FUTURE ACTIONS FOR PALEONTOLOGICAL RESOURCES IN THE CUMULATIVE EFFECTS STUDY AREA OF THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES		
Alternative	Past and Present Actions	Reasonably Foreseeable Future Actions
COUT BAX-B	Banning Siding Loadout Coal Mine, Bear Canyon Coal Mine, COVOL Site Coal Mine, Deer Creek Coal Lease, Dugout Coal Mine, Hiawatha Complex Coal Mine, Savage Coal Terminal, Star Point Waste Fuel Coal Mine, Sunnyside Refuse/Slurry Coal Mine, Wildcat Loadout Coal Mine, Flatirons Resources #1-4 Compressor Plant and Pipeline, Utah National Guard Engineering Battalion Training Area, abandoned White Sands Missile Launch Facility, Utah State Institutional Trust Lands Administration Active Leaves (shale, mineral, and potash), Bureau of Land Management Oil and Gas Leases, Ferron Natural Gas Project, Colorado State Oil and Gas Leases, Utah Division of Oil, Gas and Mining Oil and Gas Well Pads, Enterprise Mid-America Pipeline, Western Expansion II Pipeline, and Residential Areas	TransWest Express Transmission Project, Price Residential and Annexations, Woodside Power Generation
COUT BAX-C	Same as COUT BAX-B	Same as COUT BAX-B with the addition of Blue Castle Footprint for Proposed Nuclear Power Plant and Twin Bridges Resources, LLC Oil and Gas Development, and Green River Industrial
COUT BAX-E	Same as COUT BAX-B	Same as COUT BAX-B with the addition of Blue Castle Footprint for Proposed Nuclear Power Plant and Twin Bridges Resources, LLC Oil and Gas Development, and Green River Industrial

The COUT BAX alternative routes share alignments along Links C177, C185, C195, C196, C197, C270, U490, U486, and U487. The impacts from the Project would contribute cumulatively to the impacts of present and past projects and RFFAs cumulative effects of the Project, other present and past projects, and RFFAs on those geological units with moderate or high sensitivity. However, application of selective mitigation measures, including preconstruction surveys for paleontological resources, is anticipated to minimize the incremental Project effects.

For the COUT BAX alternative routes, development associated with several large past and present actions have contributed to cumulative impacts on paleontological resources, including activities on SITLA Active Leases and Colorado State Oil and Gas Leases that are large in scope. Several mines also are present. In addition to Project impacts, RFFAs, such as TransWest Express Transmission Project, if implemented, would add to the cumulative effects on paleontological resources. For the COUT BAX alternative routes, the extent of cumulative development would be similar because some of the same past and other present actions and RFFAs occur in the CIAA for alternative routes. However, three additional RFFAs in the CIAA for Alternatives COUT BAX-C and COUT BAX-E, the Blue Castle Nuclear Plant, Green River Industrial, and Twin Ridges Resources, LLC Oil and Gas Development would occur. Thus, the extent of potential cumulative effects associated with cumulative development associated with Alternatives COUT BAX-C and COUT BAX-E would be greater than those for Alternative COUT BAX-B.

4.3.3.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

The COUT alternative routes share alignments along Links C186, U460, U621, U638, U639, and U640. The impacts from the Project would contribute cumulatively to the impacts of other present, past projects, and RFFAs cumulative effects of the Project, other present and past projects, and RFFAs on those geological units with moderate or high sensitivity. However, application of selective mitigation measures, including preconstruction surveys for paleontological resources, is anticipated to minimize the incremental Project effects.

Similar past and present actions are in the CIAA for Alternatives COUT-A, COUT-B, COUT-C, and their route variations, as are the past and present actions in the CIAA for Alternatives COUT-H and COUT-I. The RFFAs in the CIAA for all COUT alternative routes are similar. Projects that could have cumulative effects associated with the implementation of the Project for the COUT alternative routes and route variations are shown in Table 4-36.

TABLE 4-36 PAST, PRESENT, AND OTHER REASONABLY FORESEEABLE FUTURE ACTIONS FOR PALEONTOLOGICAL RESOURCES IN THE CUMULATIVE EFFECTS STUDY AREA OF THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES		
Alternative	Past and Present Actions	Reasonably Foreseeable Future Actions
Alternative COUT-A and Route Variation		
COUT-A	BLM Oil and Gas Leases, Colorado State Oil and Gas Leases, Utah State Institutional Trust Lands Administration (SITLA) Oil and Gas Leases	TransWest Express Transmission Project
COUT-A-1	Same as COUT-A	Same as COUT-A
Alternative COUT-B and Route Variations		
COUT-B	Same as COUT-A	Same as COUT-A
COUT-B-1	Same as COUT-A	Same as COUT-A
COUT-B-2	Same as COUT-A	Same as COUT-A
COUT-B-3	Same as COUT-A	Same as COUT-A
COUT-B-4	Same as COUT-A	Same as COUT-A
COUT-B-5	Same as COUT-A	Same as COUT-A

TABLE 4-36 PAST, PRESENT, AND OTHER REASONABLY FORESEEABLE FUTURE ACTIONS FOR PALEONTOLOGICAL RESOURCES IN THE CUMULATIVE EFFECTS STUDY AREA OF THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES		
Alternative	Past and Present Actions	Reasonably Foreseeable Future Actions
Alternative COUT-C and Route Variations		
COUT-C	Same as COUT-A	Same as COUT-A
COUT-C-1	Same as COUT-A	Same as COUT-A
COUT-C-2	Same as COUT-A	Same as COUT-A
COUT-C-3 (Agency Preferred Alternative)	Same as COUT-A	Same as COUT-A
COUT-C-4	Same as COUT-A	Same as COUT-A
COUT-C-5	Same as COUT-A	Same as COUT-A
Alternatives COUT-H and COUT-I		
COUT-H (Applicant Preferred Alternative)	Banning Siding Loadout Coal Mine, Bear Canyon Coal Mine, COVOL Site Coal Mine, Dugout Coal Mine, Hiawatha Complex Coal Mine, Savage Coal Terminal, Star Point Waste Fuel Coal Mine, Sunnyside Refuse/Slurry Coal Mine, Wildcat Loadout Coal Mine, UT National Guard Engineering Battalion Training Area, SITLA Active Oil and Gas Leases, SITLA Active Sand and Gravel Permits, BLM Oil and Gas Leases, Ferron Natural Gas Project, Colorado State Oil and Gas Leases, Utah Division of Oil, Gas and Mining Oil and Gas Well Pads, Enterprise Mid-America Pipeline, and Residential Areas	TransWest Express Transmission Project, Price Residential and Annexations
COUT-I	Same as COUT-H	Same as COUT-H

For Alternatives COUT-A, COUT-B, and COUT-C and their route variations, development associated with several large past and present actions have contributed to cumulative impacts on paleontological resources, including activities on BLM and Colorado State Oil and Gas Leases. In addition to Project impacts, RFFAs, such as TransWest Express Transmission Project, if implemented, would add to the cumulative effects on paleontological resources.

Alternatives COUT-H and COUT-I have the same cumulative effects as Alternatives COUT-A, COUT-B, and COUT-C, with the addition of several coal mines, SITLA leases, well pads, and other facilities. The TransWest Express transmission line is also a RFFA for Alternatives COUT-H and COUT-I, as well as the Price Residential Area and Annexations. Therefore, implementation of these projects could contribute to the cumulative effects on paleontological resources if appropriate mitigation was not applied.

4.3.4 Water Resources

The geographic and temporal scopes defined for analysis of cumulative effects on water resources is presented in Table 4-3. This analysis relies on direct and indirect impacts from the Project detailed in

Section 3.2.4 and considers them in conjunction with the past, present, and RFFAs listed in Tables 4-1 and 4-2.

For this cumulative effects analysis, water-resource categories (specially designated waters, wetlands and riparian areas, lentic and lotic waters) identified in Chapter 3 were grouped to assess potential cumulative impacts on water resources. Water resources in each subbasin consist of line and polygon features from the NHD. Line features such as perennial streams were buffered by 100 feet to create a conservative polygon 200 feet wide. No buffer was applied to polygon features including perennial lakes, reservoirs, ponds, etc.; the area included in the original feature attributes was used in the analysis. These areas were then combined for water resources to calculate the total water resources, in acres, for each subbasin; which when combined with all other subbasins crossed by a Project alternative, represents the CIAA for that proposed route.

Cumulative impacts on wetlands and riparian areas are analyzed in Section 4.3.5 and are referenced where appropriate to support a qualitative discussion of cumulative effects on the functionality of wetlands and riparian areas to maintain and improve water quality.

4.3.4.1 Issues Identified for Analysis

4.3.4.1.1 Potential Impacts on Surface Water Quality

Surface-water quality is an important feature of watershed health that, when maintained, provides long-term, beneficial effects on the environment.

4.3.4.1.2 Potential Impacts on Wetlands, Riparian Areas, and Associated Water Quality

Modification of wetlands and riparian areas can result in direct and indirect impacts on the functional capacity of these vegetation communities to maintain water quality and recharge groundwater systems.

4.3.4.1.3 Potential Impacts on Areas Particularly Susceptible to Erosion

Ground-disturbing activities in areas of fragile or highly erodible soils can contribute to adverse effects on water resources over the short- and long-term. Some impacts can be mitigated by application of design features of the Proposed Action or selective mitigation measures.

4.3.4.2 Existing Condition

Agriculture and residential, commercial, and industrial development have influenced existing water resources throughout the Project area by modification of existing water resources such as: developing water wells; piping existing streams and rivers for redirection and distribution; production and disposal of effluent; and capture/storage and discharge of surface water from manmade reservoirs or other storage facilities such as water towers. As with this Project, commercial and industrial projects are required to follow federal and state regulations requiring design features of the Proposed Action and selective mitigation measures to maintain compliance with regulations (referenced in Chapter 3) to minimize or reduce impacts on water resources. Incremental effects on water resources can include, but are not limited to, decreases in water quality as a result of sedimentation from construction of stream crossings, vegetation clearing including upland, riparian and wetland areas, modification of existing stream channels, and introduction of contaminants into or surface water through accidental spills, if design features of the Proposed Action and selective mitigation measures are not met.

In Wyoming, industrial development primarily associated with oil and gas production constitutes the greatest impact on water resources; in particular, the area between the I-80 corridor and the Wyoming-

Colorado border. These developments require ground disturbance that can alter natural hydrology as well as destabilize soil leading to increased erosion and sediment transport to receiving waters.

In Colorado, existing development is located primarily along Colorado State Highway 13 and U.S. Highway 40, and is associated with dispersed rural residences and agricultural development. South of Rangely toward Baxter Pass, areas of oil and gas development are located along Moffat County Road 23 and along the floor of West Salt Creek Canyon south of Baxter Pass. Several existing transmission lines run from the Craig Power Station adjacent to U.S. Highway 40 to the Colorado-Utah border south of the community of Dinosaur. Similar to Wyoming, these developments require ground disturbance that can alter natural hydrology as well as destabilize soil leading to increased erosion and sediment transport to receiving waters.

In Utah, existing oil and gas development in several areas including the Uinta Basin, Castle Valley, and northwest of Cisco and dispersed residences and agricultural developments in the Uinta Basin, Castle Valley, Sanpete Valley, and Juab Valley have modified existing water resources through ground disturbance and increased sedimentation from development of roads, facilities such as well pads, residences, and rights-of-way.

Not all modification of hydrology results in adverse effects on water resources. Development of springs, reclamation of damaged streams, construction, rehabilitation, and conservation of wetlands and riparian areas, and effluent treatment facilities can lead to beneficial effects on water resources by maintaining water quality.

4.3.4.3 Results

4.3.4.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Results of the analysis of cumulative effects on water resources are summarized in Table 4-37.

TABLE 4-37 WATER RESOURCES CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	1,130,379	153,715	15,058	494	169,268	961,111
WYCO-B-1	1,130,379	153,715	15,058	472	169,246	961,133
WYCO-B-2 (Agency Preferred Alternative)	1,130,379	153,715	15,058	500	169,274	961,105
WYCO-B-3	1,130,379	153,715	15,058	542	169,316	961,063
Alternative WYCO-C and Route Variations						
WYCO-C	1,130,379	153,715	15,058	774	169,548	960,831
WYCO-C-1	1,130,379	153,715	15,058	751	169,525	960,854
WYCO-C-2	1,130,379	153,715	15,058	779	169,553	960,826
WYCO-C-3	1,130,379	153,715	15,058	821	169,595	960,784

TABLE 4-37 WATER RESOURCES CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-D and Route Variation						
WYCO-D	1,387,388	195,895	23,496	1,329	220,720	1,166,668
WYCO-D-1	1,387,388	195,895	23,496	1,380	220,770	1,166,618
Alternative WYCO-F and Route Variations						
WYCO-F	1,130,379	153,715	15,058	657	169,431	960,948
WYCO-F-1	1,130,379	153,715	15,058	635	169,409	960,970
WYCO-F-2	1,130,379	153,715	15,058	663	169,437	960,942
WYCO-F-3	1,130,379	153,715	15,058	705	169,478	960,901
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Water resources in the CIAA for the WYCO route grouping are distributed throughout nine subbasins (refer to Section 3.2.4) and range between 1,130,379 and 1,387,388 acres depending on the route. Major perennial and intermittent systems in the area, detailed in Section 3.2.4.3.2 include, but are not limited to, the Medicine Bow, Upper North Platte, Little Snake, and White rivers, as well as Muddy Creek.

Ground-disturbing activities associated with past and present activities in the CIAA for the WYCO route group, which could currently be affecting water resources, include coal mines, historic fires since the year 2000, noncoal mines including the Sweetwater and Terry Hankins mines; oil and gas development, oil shale and tar sands development, pipelines including the Enterprise Mid-America and Western Expansion II pipelines; residential developments, vegetation management including fuel treatments, prescribed fires, habitat improvement projects, spike treatments, and mechanical treatments; and wind-energy facilities.

Past and present development has contributed to some level of ground disturbance which, over time, is expected to be compliant with federal and state reclamation requirements. Where past and present development are not meeting reclamation requirements, water resources could be affected by increased sediment loading in the intermittent and perennial systems located in proximity to the CIAA for the WYCO route grouping, especially in the watersheds feeding Muddy Creek and the Little Snake River in the Rawlins and Little Snake Field Offices where sensitive soils are highly prone to erosion and subsequent sedimentation. Refer to Section 3.2.2 for a description and location of fragile soils in the WYCO route area.

The WYCO route grouping RFFAs in the CIAA include the proposed Project, the Rosebud coal mine, the Continental Divide-Creston Junction and Kerr-McGee oil and gas projects; the Gateway West and TransWest Express transmission projects, and the Hogback Ridge wind energy project.

Ground disturbance from implementation of RFFAs, including the Project, has the potential for localized short-term, adverse cumulative effects on water resources in the CIAA. Short-term impacts could include degradation of the quality of waters from sedimentation as a result of destabilization of fragile soils and modification of upland, riparian, and wetland vegetation. However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative effects on water resources.

The incremental effect of Project development estimated for the alternative routes in the WYCO route grouping differ only slightly between alternative routes. The Project development would account for approximately 472 to 1,380 acres (0.1 to 0.7 percent) of the total estimated cumulative effect on water resources in the CIAA. Development of the Project when added to the past, present, and RFFAs could result in potential cumulative effects on 169,246 to 220,720 acres (15 to 19 percent) of the total available water resources in the CIAA. However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on water resources.

4.3.4.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Results of the analysis of cumulative effects on water resources are summarized in Table 4-38.

TABLE 4-38 WATER RESOURCES CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	1,503,678	86,302	18,640	1,568	106,510	1,397,168
COUT BAX-C	1,709,251	96,689	20,952	1,962	119,603	1,589,649
COUT BAX-E	1,709,251	96,689	20,952	1,761	119,402	1,589,850
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Water resources in the CIAA for the COUT BAX route grouping are distributed throughout nine subbasins (refer to Section 3.2.4) and range between 1,503,678 and 1,709,251 acres depending on the route. Major perennial systems in the area detailed in Section 3.2.4.3.2 include, but are not limited, to the Green, White, and San Pitch rivers as well as Currant, Huntington, Douglas, Salt, and West creeks.

Ground-disturbing activities associated with past and present activities in the CIAA for the COUT BAX route group, which could currently be affecting water resources, include coal mines, historic fires since the year 2000, noncoal mines, oil and gas developments, oil shale and tar sands development, pipelines including the Enterprise Mid-America and Western Expansion II projects; the Clear Creek residential development, and vegetation treatments ranging from fuels management projects to habitat improvement projects.

Past and present development has contributed to some level of ground disturbance which, over time, is expected to be compliant with federal and state reclamation requirements. Where past and present development are not meeting reclamation requirements, water resources could be affected by increased sediment loading in the intermittent and perennial systems proximal to the CIAA of the COUT BAX route grouping.

Beneficial effects of other past and present projects also could be affecting water resources. Such effects would be attributed to habitat improvement projects where management of upland, riparian, wetland, and aquatic habitats could indirectly improve water quality.

Cumulative effects related to past and present actions in the CIAA of the COUT BAX route grouping also could be affecting wetlands and riparian areas. Adverse impacts from developments, which compromise the functional capacity of wetlands and riparian areas, has or is currently affecting water quality in those areas.

RFFAs in the CIAA for the COUT BAX route grouping include the proposed Project, the Flat Canyon Coal tracts, the Narrows East Bench Diversion Dam and associated pipelines, proposed oil and gas developments, the TransWest Express Transmission Project, the Narrows Tunnel Project, and the Shalom Electric Boulger timber salvage project.

Ground disturbance from implementation of RFFAs, including the Project would have the potential for localized short-term, adverse cumulative effects on water resources in the CIAA. Short-term impacts could include degrading the quality of waters from sedimentation as a result of destabilization of sensitive soils and modification of upland, riparian, and wetland vegetation. However, implementation of design features for environmental protection and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative effects on water resources.

Impaired and outstanding waters in Colorado and Utah in the CIAA of the COUT BAX route grouping (refer to Section 3.2.4.3.2) are especially susceptible to effects from past, present, and RFFAs. Protective measures mandated through the NPDES largely would mitigate any adverse impacts on impaired waters from those projects but given these waters have already been identified as impaired waters, limitations on allowable TMDLs of source pollutants contributing some level of impairment for 303(d) listed waterbodies are likely already incorporated into the TMDL. These limitations restrict any new sources of impairment thus; levels of impairment should be either constant or declining as a result of the NPDES program.

In Colorado, the risk of erosion and sedimentation is not as severe as what is expected in Utah. This can be attributed to topography and soil characteristics. Where the CIAA crosses Colorado, slopes are not especially steep and soils are not characterized as highly erodible or otherwise fragile. However, where the CIAA crosses waterbodies and especially perennial systems, the inherent potential for sediment to be discharged into the adjacent waterbody is still relatively high. Where the Project, along with other past, present, and RFFAs cross water bodies near the Garfield and Rio Blanco county line; there is a greater risk of erosion and sedimentation to adjacent waters.

In Utah, steep topography and the Green River shale formation has resulted in areas of highly erodible soils, particularly susceptible to adverse impacts from ground disturbance, which could result in transport of sediment to downstream waterbodies. Specifically, where the CIAA crosses the Ashley National Forest near Strawberry Reservoir, the southeast portion of the Uinta National Forest, the canyons throughout the Manti-La Sal National Forest and the mountainous region west-southwest of Huntington, Utah, are areas of greatest concern for erosion.

As a general rule, any areas with steep slopes in proximity to water resources raise the potential that ground disturbance resulting from the Project as well as past, present, and RFFAs would result in sediment being discharged to waterbodies, subsequently decreasing water quality in those systems. For a detailed discussion of areas particularly susceptible to erosion, refer to Section 3.2.2.

The incremental effect of Project development estimated for alternative routes within the COUT BAX route grouping differ only slightly between alternative routes. The incremental project development would account for approximately 1,586 to 1,962 acres (1.5 to 1.6 percent) of the total estimated cumulative effects on water resources in the CIAA. Development of the Project when added to the past, present, and RFFAs could result in potential cumulative effects on 106,510 to 119,603 acres (0.1 to 7.0 percent) of the total water resources in the CIAA. However, implementation of design features for environmental protection and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on water resources.

4.3.4.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Results of the analysis of cumulative effects on water resources are summarized in Table 4-39

TABLE 4-39 WATER RESOURCES CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	1,177,021	77,538	13,240	1,375	92,153	1,084,868
COUT-A-1	1,177,021	77,538	13,240	1,362	92,140	1,084,881
Alternative COUT-B and Route Variations						
COUT-B	1,393,697	88,068	15,484	2,177	105,729	1,287,968
COUT-B-1	1,476,955	103,446	17,032	1,982	122,460	1,354,495
COUT-B-2	1,476,955	103,446	17,032	1,946	122,425	1,354,530
COUT-B-3	1,393,697	88,068	15,484	1,998	105,550	1,288,147
COUT-B-4	1,476,955	103,446	17,032	1,910	122,389	1,354,566
COUT-B-5	1,393,697	88,068	15,484	2,080	105,632	1,288,065
Alternative COUT-C and Route Variations						
COUT-C	1,443,532	87,949	16,909	2,079	106,937	1,336,595
COUT-C-1	1,526,790	103,328	18,457	1,836	123,620	1,403,169
COUT-C-2	1,526,790	103,328	18,457	1,797	123,581	1,403,208
COUT-C-3 (Agency Preferred Alternative)	1,443,532	87,949	16,909	1,905	106,763	1,336,769
COUT-C-4	1,526,790	103,328	18,457	1,582	123,366	1,403,423
COUT-C-5	1,443,532	87,949	16,909	1,620	106,478	1,337,054
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	1,642,154	95,529	20,090	2,237	117,856	1,524,298
COUT-I	1,642,154	95,529	20,090	1,926	117,545	1,524,609
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Water resources in the CIAA for the COUT route grouping are distributed throughout nine subbasins (refer to Section 3.2.4) and range between 1,393,697 and 1,642,154 acres depending on the route. Many perennial systems occur in the CIAA and include but are not limited to the Duchesne, Green, Lake Fork, Price, Strawberry, Uinta, and White rivers as well as Argyle, Hop, Indian, Red, Salt, Soldier, Sowers, Thistle, Tie Fork, and Willow creeks.

Ground-disturbing activities associated with past and present activities in the CIAA for the COUT route grouping, which currently could be affecting water resources include active coal mines, Central Utah Telephone Fiber Optic communication lines, the lower Duchesne River Wetlands Project, historic fires since the year 2000, noncoal mine leases on SITLA lands, oil and gas development on BLM-administered land as well as SITLA and private holdings; oil shale and tar sands projects, pipelines including the Roosevelt, Enterprise Mid-America, Western Expansion-II and the Magnum Gas Storage project; the Carbon County proposed ATV trail, a number of residential developments, and vegetation management

projects including fuel, weed, and habitat treatment projects on BLM-administered land along the Vernal and White River field office boundaries.

Past and present development has contributed to some level of ground disturbance which, over time, is expected to be compliant with federal and state reclamation requirements. Where past and present development are not meeting reclamation requirements, water resources could be affected by increased sediment loading in the intermittent and perennial systems proximal to the CIAA of the COUT BAX route grouping.

RFFAs in the CIAA for the COUT route grouping include the proposed Project, the Flat Canyon and Long Canyon coal mine leases, the Narrows Reservoir, East Bench diversion dam, Narrows tunnel and associated Upper Cottonwood and Oak Creek pipelines; the Price industrial complex, oil and gas development from the Kerr-McGee and Monument Butte projects, the Woodside power generation facility, the Narrows highway relocation project, the Shalom Electric Boulder timber salvage project, the Victory Pipeline project, and the TransWest Express Transmission Project.

Ground disturbance from implementation of RFFAs including the Project, has the potential for localized short-term, adverse cumulative effects on water resources in the CIAA. Short-term impacts could be attributed to degrading the quality of waters from sedimentation as a result of destabilization of sensitive soils and modification of upland, riparian, and wetland vegetation. However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas would minimize cumulative effects on water resources.

Impaired and outstanding waters in Colorado and Utah in the CIAA of the COUT route grouping (refer to Section 3.2.4.3.2) are especially susceptible to past, present, and RFFAs. Protective measures mandated through the NPDES would largely mitigate any adverse impacts on impaired waters from those projects but given these waters have already been identified as impaired waters, limitations on allowable TMDLs of source pollutants contributing some level of impairment for 303(d) listed waters are already incorporated into the TMDL. These limitations restrict any new sources of impairment; levels of impairment should be either constant or declining as a result of the NPDES program.

In Colorado, the risk of erosion and sedimentation is not as severe as what is expected in Utah. This can be attributed to topography and soil type. Where the CIAA crosses Colorado, slopes are not especially steep and soils are not characterized as highly erodible or otherwise fragile. However, where the CIAA crosses waterbodies and especially perennial systems, the inherent potential for sediment to be discharged into the adjacent waterbody is still relatively high. It should be noted that where the Project, along with other past, present, and RFFAs cross water bodies near the Garfield and Rio Blanco county line; there is a greater risk of erosion and sedimentation to adjacent waters.

In Utah, steep topography and the Green River shale formation has resulted in areas of highly erodible soils, particularly susceptible to adverse impacts from ground disturbance, which could result in transport of sediment to downstream waterbodies. Specifically, where the CIAA crosses the Ashley National Forest near Strawberry Reservoir, the southeast portion of the Uinta National Forest, the canyons throughout the Manti-La Sal National Forest and the mountainous region west-southwest of Huntington, Utah, are areas of greatest concern for erosion.

As a general rule, any areas with steep slopes in proximity to water resources raises the potential that ground disturbance resulting from the Project as well as past, present, and RFFAs would result in sediment being discharged to waterbodies, subsequently decreasing water quality.

The incremental project development estimated for alternative routes within the COUT route grouping would account from approximately 1,362 to 2,177 acres (1.5 to 2 percent) of the total estimated

cumulative development in the CIAA. Development of the Project when added to the past, present, and RFFAs could result in potential cumulative effects on 92,140 to 123,620 acres (1.5 to 8 percent) of the total water resources in the CIAA. However, implementation of design features for environmental protection and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on water resources.

4.3.5 Vegetation

This section addresses cumulative effects on vegetation resources resulting from the Project in addition to other past, present, and RFFAs. Resources addressed in this section are the same as those described in Section 3.2.5.

The approach for analysis of cumulative effects on vegetation, including the geographic and temporal scopes of analysis, is presented in Table 4-3. The cumulative effects analysis for vegetation considers past, present, and RFFAs (Tables 4-1 and 4-2) in conjunction with direct and indirect impacts from the Project (described in Section 3.2.5.4.3).

Most direct cumulative impacts on vegetation associated with construction of the Proposed Action would occur in the immediate vicinity of access road, transmission line tower, and Project facility construction. However, some anticipated direct and indirect cumulative effects (described in Section 3.2.5.4), such as introduction and spread of noxious weeds, may occur in the immediate vicinity of Project-related construction as well as in a larger geographical context. The geographic scope of the CIAA for vegetation is all subwatersheds (12-digit HUCs) crossed by alternative routes considered. The analysis area is sufficient to analyze all potential cumulative effects of the Project on vegetation.

The temporal scope of the analysis includes 5 years for impacts associated with Project construction and site stabilization. The Proposed Action does not include plans to decommission the Project; therefore, the temporal scope of analysis for impacts associated with operation and maintenance of the Project is based on the assumption that the effects of operating and maintaining the transmission line would persist for the life of the Project (50 years or longer). Because the Proposed Action does not include decommissioning (refer to Section 2.4.9), long-term impacts associated with the presence of the transmission line (e.g., tower foundations) may be permanent.

4.3.5.1 Issues Identified for Analysis

4.3.5.1.1 Potential for Spread of Noxious Weeds

The potential spread of noxious weeds was identified by the agencies and public during scoping as an issue relating to vegetation resources (Table 4-3). The susceptibility of an area to colonization by invasive species increases with vegetation removal and soil disturbance (Hobbs and Huenneke 1992), both of which would occur with Project implementation. Cumulative impacts on vegetation resulting from increased potential for spread of noxious weeds are discussed qualitatively in the results section (Section 4.3.5.4).

4.3.5.1.2 Loss of Native Vegetation Communities

Loss of native upland vegetation communities (this excludes agriculture, developed/disturbed, and invasive vegetation), wetlands, and riparian areas was identified by the agencies and public during scoping as issues relating to vegetation resources (Table 4-3). Removal of vegetation would occur with construction of access roads, transmission towers, and other permanent Project structures. Cumulative impacts on these vegetation types are analyzed quantitatively and discussed quantitatively in the results section (Section 4.3.5.5).

4.3.5.2 Existing Condition

Conversion of native vegetation to agricultural use since settlement of European peoples in the area in the middle of the 19th century has significantly affected the character of landscapes and the quantity and quality of vegetation resources in the CIAA. Construction of settlements, transportation systems, and human population growth also has resulted in further conversion of vegetation resources of the area. Drought, wildfire, and climate change have likewise resulted in changes in vegetation resources in more recent times. Incremental modification of the landscape by more recent projects and actions, as described in the previous section, also has occurred in this area, further contributing to its departure from pre-settlement ecological conditions.

Descriptions of vegetation communities that are crossed by alternatives routes considered for the Project are provided in Section 3.2.5.5. Descriptions of vegetation communities and information on how they relate to GAP landcover types are provided in Appendix E.

4.3.5.3 Results

4.3.5.3.1 Potential for Spread of Noxious Weeds

The removal of vegetation, disturbance of soils, and transportation of seeds by humans and/or livestock increase the likelihood of noxious weed invasion and spread in an area (refer to Section 3.2.5.4.3). Past actions that required the removal of vegetation and disturbance of soil likely resulted in the introduction of some noxious weeds in the CIAA. Present actions that require the removal of vegetation and disturbance of soils also may contribute to the introduction and spread of noxious weeds; however, actions on public lands are required to implement practices to prevent, treat, and monitor noxious weed invasions and, therefore, their impacts are likely to be minimal. Continuing maintenance of these projects is assumed to involve some degree of noxious weed surveying, treatment, and monitoring, which would further reduce the potential for noxious weed invasion due to these actions.

Implementation of the Project would require the removal of vegetation and the disturbance of soils, which would increase the susceptibility of the Project area to noxious weed invasion. A noxious weed management plan would be prepared for the Project based on the principles and procedures outlined in the BLM Integrated Weed Management Manual 9015 and Forest Service Noxious Weed Management Manual 2080 (refer to Table 2-8, Design Feature 5). Implementation of this plan would minimize the spread and introduction of noxious weeds, though some degree of weed invasion and spread is still likely due to large areas of ground disturbance, increased vehicle use, and increased public access that would accompany Project implementation.

Many RFFAs in the CIAA are likely to require the removal of vegetation and the disturbance of soils, further increasing the susceptibility of the Project area to noxious weed invasion. However, RFFAs are also assumed to be required to implement practices to prevent, treat, and monitor noxious weed invasions, thereby minimizing the invasion of noxious weeds due to these projects or activities. For these reasons, the Project and other RFFAs would not be expected to substantially alter the existing effects of noxious weeds on vegetation resources that have occurred as a result of past actions in the CIAA.

4.3.5.3.2 Loss of Native Vegetation Community Types

Permanent loss of vegetation occurs with the construction of features such as roads, well pads, and buildings. Temporary removal or crushing of vegetation does not result in a total loss of vegetation; however, revegetation of these areas, if undertaken, often results in vegetation communities that differ from those that occurred pre-disturbance. Vegetation communities adjacent to disturbed areas also may differ in structure and composition from those that occurred pre-disturbance, as soil disturbance and the transportation of seeds of non-native or invasive species by humans and/or livestock may have increased

the likelihood of these areas being invaded by non-native species (refer to Section 3.2.5.4.3, for more detail).

Past actions in the CIAA likely involved the removal of vegetation and the alteration of vegetation community composition and structure. Improper grazing practices and other soil-disturbing activities, as well as transport of weed seeds via human and livestock movement, have resulted in large-scale invasion of this area by noxious and invasive weeds.

Present actions also are likely to result in changes to vegetation communities by these same mechanisms, though it is assumed that selective mitigation measures or other conditions of approval would be required for actions on public lands to minimize losses of native or desirable vegetation.

Construction of Project features such as access roads, transmission towers, and operations facilities would require the permanent removal of vegetation. Safe operation of the transmission line would require the clearing of tall vegetation in the wire and border zones, which would alter the structure and composition of certain vegetation communities. Non-native plant species are likely to colonize new areas through the transport of seeds by construction and maintenance equipment. Revegetation of disturbed areas is a project design feature for environmental protection (refer to Table 2-8, Design Feature 2); however, it would be unlikely that disturbed areas would be restored to pre-disturbance conditions.

RFFAs that require the construction of permanent project features or introduce non-native plant species also would be likely to result in changes to vegetation community structure. RFFAs would further change composition and structure of some vegetation communities, contributing incrementally to changes in vegetation community composition that have occurred and are projected to occur in the CIAA.

Quantitative analysis of cumulative effects of the loss of vegetation resources was completed through an inventory of each native vegetation community and an estimation of impacts in these communities by past and present actions and the Proposed Action and other RFFAs. Existing quantities of vegetation cover by community (in acres) in the CIAA was determined using reclassified GAP data. Wetland and riparian vegetation communities incorporate NWI data in addition to GAP data. Development associated with past, present, and RFFAs was estimated using shapefiles of specific projects received from agencies and local governments. Incremental project development was estimated using assumptions of extent of access road and transmission line tower disturbance for mile of alternative as described in Section 2.5.1.2.

Predicted cumulative effects on each vegetation community are described in this section. Detailed lists of activities in the CIAAs of each alternative route have been included in the Project administrative record for this Project (BLM n.d.).

Alpine

The incremental loss of alpine vegetation communities predicted under Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E would contribute to the cumulative loss of alpine vegetation communities in the CIAA. The extent of cumulative development on alpine vegetation communities for all relevant alternative routes is summarized in Table 4-40.

TABLE 4-40 ALPINE VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	2	0	0	0	0	2
WYCO-B-1	2	0	0	0	0	2
WYCO-B-2 (Agency Preferred Alternative)	2	0	0	0	0	2
WYCO-B-3	2	0	0	0	0	2
Alternative WYCO-C and Route Variations						
WYCO-C	2	0	0	0	0	2
WYCO-C-1	2	0	0	0	0	2
WYCO-C-2	2	0	0	0	0	2
WYCO-C-3	2	0	0	0	0	2
Alternative WYCO-D and Route Variation						
WYCO-D	20	2	0	0	2	18
WYCO-D-1	20	2	0	0	2	18
Alternative WYCO-F and Route Variations						
WYCO-F	2	0	0	0	0	2
WYCO-F-1	2	0	0	0	0	2
WYCO-F-2	2	0	0	0	0	2
WYCO-F-3	2	0	0	0	0	2
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	4,775	1,310	5	2	1,317	3,458
COUT BAX-C	4,775	1,310	5	2	1,317	3,458
COUT BAX-E	1,637	392	78	1	471	1,166
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
Alternative COUT-A and Route Variation						
COUT-A	3,950	1,148	30	6	1,184	2,766
COUT-A-1	3,950	1,148	30	4	1,182	2,768
Alternative COUT-B and Route Variations						
COUT-B	4,962	1,737	101	0	1,838	3,124
COUT-B-1	4,060	1,673	33	0	1,706	2,354
COUT-B-2	4,169	1,676	33	0	1,709	2,459
COUT-B-3	4,546	1,709	40	0	1,750	2,796
COUT-B-4	4,559	1,710	40	0	1,750	2,809
COUT-B-5	4,155	1,676	33	0	1,709	2,446

TABLE 4-40 ALPINE VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	3,721	678	79	1	758	2,963
COUT-C-1	2,106	235	17	1	253	1,853
COUT-C-2	2,215	238	17	1	256	1,959
COUT-C-3 (Agency Preferred Alternative)	2,201	237	17	1	255	1,946
COUT-C-4	2,439	268	19	3	290	2,149
COUT-C-5	2,425	268	19	3	289	2,136
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	3,494	692	87	1	780	2,714
COUT-I	5,847	1,633	14	11	1,658	4,190
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect alpine vegetation communities are coal mining operations, habitat and rangeland management activities for the BLM Vernal Field Office, fuel treatments for the BLM Vernal Field Office, the Sheep Creek Vegetation Management Area, Miller's Flat vegetation maintenance activities, historic wildland fires, pipelines, oil and gas development, residential development, and Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines). RFFAs in the CIAA for alpine vegetation communities are coal mining operations, residential development, the TransWest Express Transmission Project, a timber salvage project, and Utah Department of Wildlife Resources watershed restoration focus areas.

The extent of Project-related development in alpine vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-41). Total cumulative effects, including those from the Project, affect a considerable amount of the total extent of these vegetation communities in the CIAA, though these impacts are mainly due to past and present activities (Table 4-1).

Aspen

The loss of aspen vegetation communities under Alternatives COUT BAX and COUT route groupings would contribute to the cumulative loss of alpine vegetation communities in the CIAA. The extent of cumulative development on alpine vegetation communities for all relevant alternative routes is summarized in Table 4-41.

TABLE 4-41 ASPEN VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	444	10	2	0	12	433
WYCO-B-1	444	10	2	0	12	433
WYCO-B-2 (Agency Preferred Alternative)	444	10	2	0	12	433
WYCO-B-3	444	10	2	0	12	433
Alternative WYCO-C and Route Variations						
WYCO-C	444	10	2	0	12	433
WYCO-C-1	444	10	2	0	12	433
WYCO-C-2	444	10	2	0	12	433
WYCO-C-3	444	10	2	0	12	433
Alternative WYCO-D and Route Variation						
WYCO-D	20,711	1,344	1,260	0	2,604	18,107
WYCO-D-1	20,711	1,344	1,260	0	2,604	18,107
Alternative WYCO-F and Route Variations						
WYCO-F	444	10	2	0	12	433
WYCO-F-1	444	10	2	0	12	433
WYCO-F-2	444	10	2	0	12	433
WYCO-F-3	444	10	2	0	12	433
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	52,040	13,170	189	88	13,447	38,593
COUT BAX-C	52,040	13,170	189	86	13,446	38,594
COUT BAX-E	72,927	23,830	3,639	48	27,518	45,409
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
Alternative COUT-A and Route Variation						
COUT-A	56,096	1,469	2,032	96	3,596	52,500
COUT-A-1	56,096	1,469	2,032	112	3,613	52,483
Alternative COUT-B and Route Variations						
COUT-B	66,386	5,020	2,532	30	7,582	58,805
COUT-B-1	51,079	3,769	484	48	4,300	46,779
COUT-B-2	51,598	3,779	496	84	4,359	47,239
COUT-B-3	55,609	4,140	716	69	4,925	50,684
COUT-B-4	60,958	4,513	717	94	5,324	55,634
COUT-B-5	46,249	3,406	495	61	3,962	42,287

TABLE 4-41 ASPEN VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	67,700	4,921	2,460	31	7,412	60,287
COUT-C-1	60,933	3,932	699	55	4,686	56,247
COUT-C-2	61,451	3,943	711	93	4,747	56,704
COUT-C-3 (Agency Preferred Alternative)	56,102	3,570	710	68	4,347	51,755
COUT-C-4	59,220	3,151	638	158	3,947	55,274
COUT-C-5	53,871	2,777	638	127	3,542	50,329
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	78,841	20,251	3,856	38	24,145	54,696
COUT-I	61,224	16,014	405	84	16,503	44,721
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect aspen vegetation communities are coal mining operations, a communication facility, habitat and rangeland management activities for the BLM Vernal Field Office, fuel treatments for the BLM Vernal Field Office, the Sheep Creek Vegetation Management Area, Miller's Flat vegetation maintenance activities, BLM White River Field Office prescribed fires, historical wildland fires, oil and gas development, pipelines, residential development, Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines), and BLM White River Field Office range improvement lines. RFFAs in the CIAA that would affect aspen vegetation communities are coal mining operations, a pipeline, recreation management activities, a reservoir, residential development, sand and gravel mining, the TransWest Express Transmission Project, transportation projects, a transportation tunnel, a timber salvage project, and Utah Department of Wildlife Resources watershed restoration focus areas.

The extent of Project-related development in aspen vegetation communities would account for a small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-41). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-41).

Barren/Sparsely Vegetated

The loss of barren/sparsely vegetated vegetation communities under all alternative routes would contribute to the cumulative loss of barren/sparsely vegetated vegetation communities in the CIAA. The extent of cumulative development on barren/sparsely vegetated vegetation communities for all relevant alternative routes is summarized in Table 4-42.

TABLE 4-42 BARREN/SPARSELY VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	24,329	492	689	69	1,251	23,078
WYCO-B-1	24,329	492	689	69	1,250	23,079
WYCO-B-2 (Agency Preferred Alternative)	24,329	492	689	69	1,250	23,079
WYCO-B-3	24,329	492	689	69	1,251	23,078
Alternative WYCO-C and Route Variations						
WYCO-C	33,104	557	818	37	1,412	31,693
WYCO-C-1	33,104	557	818	36	1,412	31,693
WYCO-C-2	33,104	557	818	36	1,412	31,693
WYCO-C-3	33,104	557	818	37	1,412	31,693
Alternative WYCO-D and Route Variation						
WYCO-D	11,819	1,099	235	3	1,337	10,481
WYCO-D-1	11,819	1,099	235	3	1,337	10,481
Alternative WYCO-F and Route Variations						
WYCO-F	25,057	1,016	587	27	1,631	23,427
WYCO-F-1	25,057	1,016	587	27	1,631	23,427
WYCO-F-2	25,057	1,016	587	27	1,631	23,427
WYCO-F-3	25,057	1,016	587	27	1,631	23,427
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	131,558	4,846	5,488	271	10,606	120,952
COUT BAX-C	132,742	4,936	8,999	199	14,134	118,609
COUT BAX-E	122,555	5,163	5,933	245	11,341	111,214
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
Alternative COUT-A and Route Variation						
COUT-A	51,617	3,531	516	82	4,129	47,488
COUT-A-1	51,617	3,531	516	83	4,130	47,487
Alternative COUT-B and Route Variations						
COUT-B	60,591	4,079	306	72	4,456	56,134
COUT-B-1	60,480	4,101	294	72	4,466	56,014
COUT-B-2	60,702	4,103	294	72	4,469	56,233
COUT-B-3	59,794	4,054	298	73	4,425	55,368
COUT-B-4	62,132	4,120	298	73	4,491	57,640
COUT-B-5	58,364	4,037	294	74	4,405	53,959

TABLE 4-42 BARREN/SPARSELY VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	75,100	7,726	509	44	8,278	66,822
COUT-C-1	77,339	7,826	508	44	8,378	68,961
COUT-C-2	77,561	7,828	509	44	8,381	69,180
COUT-C-3 (Agency Preferred Alternative)	75,223	7,762	509	44	8,315	66,907
COUT-C-4	75,793	7,623	501	55	8,179	67,615
COUT-C-5	73,456	7,557	501	53	8,111	65,344
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	76,184	7,797	485	43	8,326	67,858
COUT-I	86,395	8,936	601	64	9,602	76,793
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect barren/sparsely vegetated vegetation communities are coal mining operations, habitat and range management activities for the BLM Vernal Field Office, Miller's Flat vegetation maintenance activities, BLM Rawlins Field Office prescribed fires and spike treatments, the Sheep Creek Vegetation Management Area, BLM Little Snake Field Office vegetation management treatments, historical wildland fires, pipelines, a missile launch facility, noncoal mining operations, oil and gas development, oil shale development, recreation management activities, residential development, the Seep Ridge road paving project, two wind energy facilities, Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines), and BLM White River Field Office range improvement lines. RFFAs in the CIAA that would affect barren/sparsely vegetated vegetation communities are a land annexation, coal-mining operations, a land division, oil and gas development, a power-generation facility, recreation management activities, residential development, the Gateway West and TransWest Express transmission projects, a timber salvage project, two wind-energy facilities, and Utah Department of Wildlife Resources watershed restoration focus areas.

The extent of Project-related development in barren/sparsely vegetated vegetation communities would account for a small portion of total cumulative effects on these areas in the CIAA (Table 4-42). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-42).

Big Sagebrush

The loss of big sagebrush vegetation communities under all alternative routes would contribute to the cumulative loss of big sagebrush vegetation communities in the CIAA. The extent of cumulative development on big sagebrush vegetation communities for all relevant alternative routes is summarized in Table 4-43.

TABLE 4-43 BIG SAGEBRUSH VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	690,168	30,826	21,118	1,515	53,460	636,708
WYCO-B-1	690,168	30,826	21,118	1,531	53,475	636,693
WYCO-B-2 (Agency Preferred Alternative)	690,168	30,826	21,118	1,525	53,469	636,699
WYCO-B-3	690,168	30,826	21,118	1,486	53,431	636,737
Alternative WYCO-C and Route Variations						
WYCO-C	681,175	30,055	20,647	1,445	52,147	629,029
WYCO-C-1	681,175	30,055	20,647	1,461	52,162	629,013
WYCO-C-2	681,175	30,055	20,647	1,454	52,156	629,019
WYCO-C-3	681,175	30,055	20,647	1,416	52,118	629,058
Alternative WYCO-D and Route Variation						
WYCO-D	869,397	48,451	24,081	1,884	74,415	794,982
WYCO-D-1	869,397	48,451	24,081	1,860	74,391	795,006
Alternative WYCO-F and Route Variations						
WYCO-F	772,152	35,698	24,779	1,702	62,180	709,973
WYCO-F-1	772,152	35,698	24,779	1,717	62,195	709,958
WYCO-F-2	772,152	35,698	24,779	1,711	62,188	709,964
WYCO-F-3	772,152	35,698	24,779	1,674	62,151	710,001
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	226,333	42,732	1,886	537	45,156	181,177
COUT BAX-C	225,446	42,729	1,934	493	45,156	180,291
COUT BAX-E	233,330	36,651	3,840	411	40,902	192,428
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
Alternative COUT-A and Route Variation						
COUT-A	290,455	34,832	5,707	984	41,522	248,932
COUT-A-1	290,455	34,832	5,707	956	41,495	248,960
Alternative COUT-B and Route Variations						
COUT-B	296,623	34,546	4,603	661	39,809	256,814
COUT-B-1	269,266	32,566	3,333	726	36,625	232,641
COUT-B-2	276,843	32,909	3,457	752	37,118	239,725
COUT-B-3	278,085	33,206	3,770	738	37,713	240,371
COUT-B-4	296,866	34,276	3,790	772	38,838	258,028
COUT-B-5	258,061	31,840	3,436	733	36,009	222,052

TABLE 4-43 BIG SAGEBRUSH VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	314,896	42,246	3,729	608	46,584	268,312
COUT-C-1	284,005	40,289	2,665	694	43,648	240,357
COUT-C-2	291,582	40,632	2,789	720	44,141	247,442
COUT-C-3 (Agency Preferred Alternative)	272,801	39,563	2,768	689	43,020	229,780
COUT-C-4	298,327	40,068	2,912	796	43,775	254,552
COUT-C-5	279,546	38,998	2,891	735	42,624	236,922
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	278,383	46,570	3,753	448	50,771	227,612
COUT-I	295,585	58,419	1,869	683	60,971	234,614
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect big sagebrush vegetation communities are coal-mining operations, communication facilities, habitat and rangeland management activities for the BLM Vernal Field Office, fuel treatments for the BLM Vernal Field Office, prescribed fires and spike treatments for the BLM Rawlins Field Office, Miller's Flat vegetation maintenance activities, the Sheep Creek Vegetation Management Area, vegetation treatments for the BLM Little Snake Field Office, weed management treatments and prescribed fires for the BLM White River Field Office, historical wildland fires, pipelines, a military training area, non-coal mining operations, oil and gas development, oil shale development, a power generation station, an ATV trail, residential development, a transportation project, three wind energy facilities, Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines), and BLM White River Field Office range improvement lines. RFFAs in the CIAA that would affect big sagebrush vegetation communities are a land annexation, coal mining operations, industrial development, oil and gas development, pipelines, power generation facilities and storage, recreation management activities, a reservoir, residential development, the TransWest Express Transmission Project, the Mona South transmission project, the Gateway West 500kV Transmission Project, transportation projects, a transportation tunnel, a timber salvage project, wind energy facilities, and Utah Department of Wildlife Resources restoration focus areas.

The extent of Project-related development in big sagebrush vegetation communities accounts for a small proportion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-43). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-43).

Grassland

The loss of grassland vegetation communities under all alternative routes would contribute to the cumulative loss of grassland vegetation communities in the CIAA. The extent of cumulative development on grassland vegetation communities for all relevant alternative routes is summarized in Table 4-44.

TABLE 4-44 GRASSLAND VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	11,724	1,443	217	31	1,692	10,032
WYCO-B-1	11,724	1,443	217	31	1,692	10,032
WYCO-B-2 (Agency Preferred Alternative)	11,724	1,443	217	24	1,685	10,039
WYCO-B-3	11,724	1,443	217	27	1,688	10,036
Alternative WYCO-C and Route Variations						
WYCO-C	11,742	1,443	217	31	1,692	10,050
WYCO-C-1	11,742	1,443	217	31	1,692	10,050
WYCO-C-2	11,742	1,443	217	24	1,685	10,057
WYCO-C-3	11,742	1,443	217	27	1,687	10,054
Alternative WYCO-D and Route Variation						
WYCO-D	35,120	2,576	372	42	2,989	32,131
WYCO-D-1	35,120	2,576	372	38	2,985	32,135
Alternative WYCO-F and Route Variations						
WYCO-F	12,354	1,478	217	31	1,726	10,628
WYCO-F-1	12,354	1,478	217	31	1,726	10,628
WYCO-F-2	12,354	1,478	217	24	1,719	10,635
WYCO-F-3	12,354	1,478	217	27	1,722	10,632
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	41,473	5,105	423	63	5,591	35,882
COUT BAX-C	42,703	5,196	906	58	6,160	36,543
COUT BAX-E	37,348	3,411	1,011	66	4,488	32,860
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
Alternative COUT-A and Route Variation						
COUT-A	7,798	553	88	9	650	7,148
COUT-A-1	7,798	553	88	9	650	7,148
Alternative COUT-B and Route Variations						
COUT-B	11,747	1,064	204	7	1,275	10,472
COUT-B-1	11,893	1,041	124	11	1,175	10,718
COUT-B-2	12,023	1,043	130	11	1,183	10,840
COUT-B-3	11,319	1,001	130	8	1,138	10,181
COUT-B-4	12,274	1,048	132	11	1,191	11,083
COUT-B-5	11,069	996	127	8	1,131	9,938

TABLE 4-44 GRASSLAND VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	13,553	1,756	240	35	2,032	11,521
COUT-C-1	13,922	1,622	164	39	1,825	12,097
COUT-C-2	14,052	1,623	170	39	1,833	12,220
COUT-C-3 (Agency Preferred Alternative)	13,098	1,576	167	36	1,780	11,318
COUT-C-4	13,651	1,519	168	40	1,727	11,925
COUT-C-5	12,697	1,472	166	35	1,673	11,024
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	13,503	2,334	352	32	2,718	10,784
COUT-I	19,393	4,341	184	50	4,575	14,818
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect grassland vegetation communities are coal mining operations, habitat and rangeland management activities for the BLM Vernal Field Office, fuel treatments for the BLM Vernal Field Office, Miller's Flat vegetation maintenance activities, prescribed fires and spike treatments for the BLM Rawlins Field Office, the Sheep Creek Vegetation Management Area, vegetation treatments for the BLM Little Snake Field Office, prescribed fires for the BLM White River Field Office, historical wildland fires, pipelines, a military training area, a missile launch facility, non-coal mining operations, oil and gas development, oil shale development, an ATV trail, residential development, transportation projects, two wind energy facilities, Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines), and BLM White River Field Office range improvement lines. RFFAs in the CIAA that would affect grassland vegetation communities are a land annexation, coal mining operations, industrial development, a land division, oil and gas development, power generation facilities including a nuclear power plant, recreation management activities, residential development, the Gateway West 500kV Transmission Project, the Mona South transmission project, a timber salvage project, a wind-energy facility, and Utah Department of Wildlife Resources watershed restoration focus areas.

The extent of Project-related development in grassland vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-44). All cumulative effects, including those from the Project, impact a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-44).

Montane Forest

The loss of montane forest vegetation communities under COUT BAX and COUT route groupings would contribute to the cumulative loss of montane forest vegetation communities in the CIAA. The extent of cumulative development on montane forest vegetation communities for all relevant alternative routes is summarized in Table 4-45.

TABLE 4-45 MONTANE FOREST VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	190	0	0	0	0	190
WYCO-B-1	190	0	0	0	0	190
WYCO-B-2 (Agency Preferred Alternative)	190	0	0	0	0	190
WYCO-B-3	190	0	0	0	0	190
Alternative WYCO-C and Route Variations						
WYCO-C	190	0	0	0	0	190
WYCO-C-1	190	0	0	0	0	190
WYCO-C-2	190	0	0	0	0	190
WYCO-C-3	190	0	0	0	0	190
Alternative WYCO-D and Route Variation						
WYCO-D	5,655	29	3	0	32	5,624
WYCO-D-1	5,655	29	3	0	32	5,624
Alternative COUT-F and Route Variations						
WYCO-F	190	0	0	0	0	190
WYCO-F-1	190	0	0	0	0	190
WYCO-F-2	190	0	0	0	0	190
WYCO-F-3	190	0	0	0	0	190
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	63,615	15,228	188	55	15,470	48,145
COUT BAX-C	63,627	15,228	188	54	15,469	48,158
COUT BAX-E	59,350	23,261	2,404	8	25,673	33,676
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
Alternative COUT-A and Route Variation						
COUT-A	38,426	2,046	1,514	59	3,618	34,808
COUT-A-1	38,426	2,046	1,514	67	3,626	34,800
Alternative COUT-B and Route Variations						
COUT-B	60,686	7,078	897	15	7,990	52,696
COUT-B-1	59,358	6,526	353	44	6,923	52,435
COUT-B-2	59,770	6,526	366	25	6,917	52,853
COUT-B-3	54,340	6,173	408	22	6,602	47,738
COUT-B-4	65,574	6,933	428	31	7,392	58,182
COUT-B-5	48,537	5,766	345	16	6,128	42,409

TABLE 4-45 MONTANE FOREST VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	60,162	5,949	807	22	6,777	53,385
COUT-C-1	68,343	6,812	416	67	7,295	61,048
COUT-C-2	68,755	6,812	429	47	7,288	61,467
COUT-C-3 (Agency Preferred Alternative)	57,521	6,052	408	38	6,498	51,023
COUT-C-4	61,602	3,827	338	74	4,239	57,363
COUT-C-5	50,368	3,067	317	62	3,446	46,922
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	58,070	18,173	2,558	10	20,740	37,329
COUT-I	66,080	18,269	277	68	18,614	47,466
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect montane forest vegetation communities are coal mining operations, habitat and rangeland management activities for the BLM Vernal Field Office, fuel treatments for the BLM Vernal Field Office, Miller's Flat vegetation maintenance activities, the Sheep Creek Vegetation Management Area, historical wildland fires, noncoal mining operations, prescribed fires for the BLM White River Field Office, oil and gas development, oil shale development, a pipeline, residential development, Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines), and BLM White River Field Office range improvement lines. RFFAs in the CIAA that would affect montane forest vegetation communities are coal mining, oil and gas development, a pipeline, a reservoir, residential development, the TransWest Express Transmission Project, transportation projects, a timber salvage project, a wind energy facility, and Utah Department of Wildlife Resources watershed restoration focus areas.

All impacts on montane forest vegetation communities from Project activities would co-occur with past and present actions or RFFAs to some degree, though Project-related impacts also would occur outside these areas with all alternative routes (Table 4-45). The extent of Project-related development in montane forest vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-45). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-45).

Mountain Shrub

The loss of mountain shrub vegetation communities under COUT BAX and COUT route groupings would contribute to the cumulative loss of mountain shrub vegetation communities in the CIAA. The extent of cumulative development on mountain shrub vegetation communities for all relevant alternative routes is summarized in Table 4-46.

TABLE 4-46 MOUNTAIN SHRUB VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	699	10	0	0	10	689
WYCO-B-1	699	10	0	0	10	689
WYCO-B-2 (Agency Preferred Alternative)	699	10	0	0	10	689
WYCO-B-3	699	10	0	0	10	689
Alternative WYCO-C and Route Variations						
WYCO-C	699	10	0	0	10	689
WYCO-C-1	699	10	0	0	10	689
WYCO-C-2	699	10	0	0	10	689
WYCO-C-3	699	10	0	0	10	689
Alternative WYCO-D and Route Variation						
WYCO-D	19,495	1,855	2,869	3	4,727	14,768
WYCO-D-1	19,495	1,855	2,869	3	4,727	14,768
Alternative WYCO-F and Route Variations						
WYCO-F	700	11	0	0	11	689
WYCO-F-1	700	11	0	0	11	689
WYCO-F-2	700	11	0	0	11	689
WYCO-F-3	700	11	0	0	11	689
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	91,534	20,447	401	132	20,979	70,555
COUT BAX-C	91,524	20,447	401	129	20,977	70,547
COUT BAX-E	95,525	24,319	707	129	25,156	70,369
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
Alternative COUT-A and Route Variation						
COUT-A	91,969	13,043	790	171	14,004	77,965
COUT-A-1	91,969	13,043	790	171	14,004	77,965
Alternative COUT-B and Route Variations						
COUT-B	112,987	15,848	1,089	182	17,119	95,869
COUT-B-1	106,373	15,116	1,023	223	16,362	90,011
COUT-B-2	107,178	15,128	1,031	227	16,385	90,792
COUT-B-3	108,409	15,358	1,061	201	16,620	91,789
COUT-B-4	110,254	15,410	1,061	228	16,699	93,555
COUT-B-5	105,333	15,075	1,031	205	16,311	89,022

TABLE 4-46 MOUNTAIN SHRUB VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	118,993	17,392	1,086	190	18,669	100,324
COUT-C-1	109,727	15,127	1,048	235	16,409	93,318
COUT-C-2	110,531	15,139	1,055	239	16,432	94,099
COUT-C-3 (Agency Preferred Alternative)	108,687	15,087	1,055	213	16,354	92,333
COUT-C-4	111,112	15,353	1,058	254	16,664	94,447
COUT-C-5	109,267	15,300	1,058	219	16,577	92,690
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	63,271	21,310	613	57	21,980	41,291
COUT-I	56,671	19,941	282	73	20,296	36,375
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect mountain shrub vegetation communities are coal mining, a communication facility, habitat and rangeland management activities for the BLM Vernal Field Office, fuel treatments for the BLM Vernal Field Office, Miller's Flat vegetation maintenance activities, prescribed fires for the BLM Rawlins Field Office, the Sheep Creek Vegetation Management Area, prescribed fires for the BLM White River Field Office, historical wildland fires, noncoal mining operations, oil and gas development, oil shale development, pipelines, residential development, Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines), and BLM White River Field Office range improvement lines. RFFAs in the CIAA that would affect mountain shrub vegetation communities are coal mining, oil and gas development, pipelines, recreation management activities, a reservoir, residential development, the TransWest Express Transmission Project, a transportation project, a timber salvage project, a wind energy facility, and Utah Department of Wildlife Resources watershed restoration focus areas.

Impacts from Alternative WYCO-D would all occur outside areas where past and present actions or RFFAs occur. The extent of Project-related development in mountain shrub vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-46). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-46).

Pinyon-Juniper

The loss of pinyon-juniper vegetation communities under all alternative routes would contribute to the cumulative loss of pinyon-juniper vegetation communities in the CIAA. The extent of cumulative development on pinyon-juniper vegetation communities for all relevant alternative routes is summarized in Table 4-47.

TABLE 4-47 PINYON-JUNIPER VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	73,325	2,167	582	132	2,882	70,443
WYCO-B-1	73,325	2,167	582	132	2,882	70,444
WYCO-B-2 (Agency Preferred Alternative)	73,325	2,167	582	119	2,869	70,456
WYCO-B-3	73,325	2,167	582	121	2,871	70,454
Alternative WYCO-C and Route Variations						
WYCO-C	73,327	2,167	582	129	2,879	70,449
WYCO-C-1	73,327	2,167	582	129	2,878	70,449
WYCO-C-2	73,327	2,167	582	116	2,866	70,462
WYCO-C-3	73,327	2,167	582	118	2,867	70,460
Alternative WYCO-D and Route Variation						
WYCO-D	68,031	2,738	285	43	3,066	64,965
WYCO-D-1	68,031	2,738	285	33	3,056	64,976
Alternative WYCO-F and Route Variations						
WYCO-F	74,100	2,369	594	129	3,092	71,008
WYCO-F-1	74,100	2,369	594	128	3,091	71,009
WYCO-F-2	74,100	2,369	594	116	3,079	71,021
WYCO-F-3	74,100	2,369	594	118	3,081	71,019
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	385,582	38,604	2,871	583	42,058	343,524
COUT BAX-C	382,924	38,550	3,737	505	42,792	340,132
COUT BAX-E	365,072	35,785	1,826	415	38,025	327,046
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
Alternative COUT-A and Route Variation						
COUT-A	183,908	18,988	1,276	330	20,594	163,314
COUT-A-1	183,908	18,988	1,276	330	20,594	163,314
Alternative COUT-B and Route Variations						
COUT-B	166,628	13,921	1,674	228	15,823	150,805
COUT-B-1	162,945	13,837	1,528	235	15,600	147,345
COUT-B-2	163,584	13,847	1,539	238	15,624	147,960
COUT-B-3	161,864	13,666	1,583	234	15,483	146,381
COUT-B-4	167,745	13,904	1,583	239	15,726	152,019
COUT-B-5	157,704	13,609	1,539	239	15,387	142,317

TABLE 4-47 PINYON-JUNIPER VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	214,685	19,362	1,534	372	21,268	193,418
COUT-C-1	202,757	16,116	1,424	381	17,921	184,835
COUT-C-2	203,396	16,126	1,435	384	17,945	185,451
COUT-C-3 (Agency Preferred Alternative)	197,516	15,888	1,435	382	17,706	179,810
COUT-C-4	199,953	15,694	1,443	439	17,577	182,376
COUT-C-5	194,073	15,457	1,443	421	17,321	176,753
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	213,367	24,610	880	208	25,698	187,670
COUT-I	230,570	33,210	904	366	34,480	196,091
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect pinyon-juniper vegetation communities are coal mining, a communication facility, habitat and rangeland management activities for the BLM Vernal Field Office, fuel treatments for the BLM Vernal Field Office, Miller's Flat vegetation maintenance activities, prescribed fires and spike treatments for the BLM Rawlins Field Office, the Sheep Creek Vegetation Management Area, vegetation treatments for the BLM Little Snake Field Office, prescribed fires for the BLM White River Field Office, historical wildland fires, pipelines, noncoal mining operations, oil and gas development, oil shale development, an ATV trail, residential development, transportation projects, two wind energy facilities, Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines), and BLM White River Field Office range improvement lines. RFFAs in the CIAA that would affect pinyon-juniper vegetation communities are a land annexation, coal mining, industrial development, oil and gas development, a pipeline, a power generation facility, recreation management activities, the TransWest Express Transmission Project, the Gateway West 500kV Transmission Project, the Mona South Transmission Project, two wind energy facilities, and Utah Department of Wildlife Resources watershed restoration focus areas.

All impacts on pinyon-juniper vegetation communities from Project activities would co-occur with past and present actions or RFFAs to some degree, though Project-related impacts also would occur outside these areas with all alternative routes (Table 4-47). The extent of Project-related development in pinyon-juniper vegetation communities would account for a small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-47). All cumulative effects, including those from the Project, impact a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-47).

Riparian

The loss of riparian vegetation communities under all alternative routes would contribute to the cumulative loss of riparian vegetation communities in the CIAA. The extent of cumulative development on riparian vegetation communities for all relevant alternative routes is summarized in Table 4-48.

TABLE 4-48 RIPARIAN VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	10,593	951	465	30	1,446	9,147
WYCO-B-1	10,593	951	465	30	1,446	9,147
WYCO-B-2 (Agency Preferred Alternative)	10,593	951	465	30	1,446	9,147
WYCO-B-3	10,593	951	465	30	1,446	9,147
Alternative WYCO-C and Route Variations						
WYCO-C	12,032	1,007	545	23	1,575	10,457
WYCO-C-1	12,032	1,007	545	23	1,575	10,457
WYCO-C-2	12,032	1,007	545	23	1,575	10,457
WYCO-C-3	12,032	1,007	545	23	1,575	10,457
Alternative WYCO-D and Route Variation						
WYCO-D	15,474	2,732	488	43	3,263	12,211
WYCO-D-1	15,474	2,732	488	43	3,263	12,211
Alternative WYCO-F and Route Variations						
WYCO-F	11,820	1,005	524	29	1,559	10,261
WYCO-F-1	11,820	1,005	524	29	1,559	10,262
WYCO-F-2	11,820	1,005	524	29	1,559	10,262
WYCO-F-3	11,820	1,005	524	29	1,559	10,261
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	12,117	4,887	61	10	4,958	7,159
COUT BAX-C	11,835	4,617	506	10	5,133	6,702
COUT BAX-E	11,646	2,421	601	11	3,032	8,615
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
Alternative COUT-A and Route Variation						
COUT-A	21,252	4,295	701	59	5,055	16,197
COUT-A-1	21,252	4,295	701	67	5,063	16,190
Alternative COUT-B and Route Variations						
COUT-B	12,703	3,038	122	16	3,177	9,526
COUT-B-1	12,575	3,016	118	17	3,150	9,425
COUT-B-2	12,576	3,016	118	17	3,150	9,426
COUT-B-3	12,520	3,007	118	17	3,141	9,379
COUT-B-4	12,600	3,017	118	17	3,151	9,449
COUT-B-5	12,496	3,006	118	17	3,141	9,356

TABLE 4-48 RIPARIAN VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	12,578	1,847	73	10	1,929	10,649
COUT-C-1	12,299	1,773	68	11	1,851	10,448
COUT-C-2	12,300	1,773	68	11	1,851	10,449
COUT-C-3 (Agency Preferred Alternative)	12,220	1,763	68	11	1,841	10,379
COUT-C-4	12,283	1,772	68	11	1,851	10,432
COUT-C-5	12,203	1,762	68	10	1,840	10,363
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	9,920	1,806	41	1	1,848	8,071
COUT-I	14,311	4,818	66	5	4,890	9,421
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect riparian vegetation communities are coal mining, a communication facility, habitat and rangeland management activities for the BLM Vernal Field Office, prescribed fires and spike treatments for the BLM Rawlins Field Office, the Sheep Creek Vegetation Management Area, vegetation mechanical treatments, weed treatments, and prescribed fires for the BLM White River Field Office, vegetation treatments for the BLM Little Snake Field Office, historical wildland fires, pipelines, noncoal mining operations, oil and gas development, oil shale development, an ATV trail, residential development, two wind energy facilities, Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines), and BLM White River Field Office range improvement lines. RFFAs in the CIAA that would affect riparian vegetation communities are coal mining, industrial development, a diversion dam, oil and gas development, a pipeline, a power generation station, residential development, the TransWest Express Transmission Project, the Gateway West 500kV Transmission Project, transportation projects, a wind energy facility, and a Utah Department of Wildlife Resources watershed restoration focus area.

All impacts on riparian vegetation communities from Project activities would co-occur with past and present actions or RFFAs to some degree, though Project-related impacts also would occur outside these areas with all alternative routes (Table 4-48). The extent of Project-related development in riparian vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-48). All cumulative effects, including those from the Project, impact a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-48).

Shrub/Shrub Steppe

The loss of shrub/shrub steppe vegetation communities under all alternative routes would contribute to the cumulative loss of shrub/shrub steppe vegetation communities in the CIAA. The extent of cumulative development on shrub/shrub steppe vegetation communities for all relevant alternative routes is summarized in Table 4-49.

TABLE 4-49 SHRUB/SHRUB STEPPE VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	360,242	14,242	14,646	1,003	29,891	330,351
WYCO-B-1	360,242	14,242	14,646	1,003	29,891	330,351
WYCO-B-2 (Agency Preferred Alternative)	360,242	14,242	14,646	1,000	29,888	330,354
WYCO-B-3	360,242	14,242	14,646	1,002	29,890	330,352
Alternative WYCO-C and Route Variations						
WYCO-C	427,124	16,065	17,355	908	34,329	392,795
WYCO-C-1	427,124	16,065	17,355	909	34,329	392,795
WYCO-C-2	427,124	16,065	17,355	906	34,326	392,798
WYCO-C-3	427,124	16,065	17,355	908	34,328	392,796
Alternative WYCO-D and Route Variation						
WYCO-D	245,575	15,471	10,968	479	26,918	218,658
WYCO-D-1	245,575	15,471	10,968	480	26,919	218,657
Alternative WYCO-F and Route Variations						
WYCO-F	377,763	15,829	15,913	897	32,639	345,124
WYCO-F-1	377,763	15,829	15,913	897	32,639	345,124
WYCO-F-2	377,763	15,829	15,913	894	32,636	345,127
WYCO-F-3	377,763	15,829	15,913	896	32,638	345,125
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	522,635	34,106	14,341	1,319	49,767	472,869
COUT BAX-C	556,949	35,074	25,665	1,234	61,973	494,976
COUT BAX-E	532,359	33,638	22,029	1,531	57,198	475,161
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
Alternative COUT-A and Route Variation						
COUT-A	131,757	13,299	952	352	14,603	117,154
COUT-A-1	131,757	13,299	952	352	14,603	117,154
Alternative COUT-B and Route Variations						
COUT-B	156,572	19,785	1,078	235	21,098	135,475
COUT-B-1	156,344	19,779	1,072	235	21,086	135,258
COUT-B-2	156,355	19,779	1,075	235	21,089	135,266
COUT-B-3	156,366	19,779	1,075	235	21,089	135,277
COUT-B-4	156,393	19,779	1,075	235	21,089	135,304
COUT-B-5	156,328	19,778	1,075	240	21,094	135,234

TABLE 4-49 SHRUB/SHRUB STEPPE VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	251,082	36,822	3,407	430	40,660	210,422
COUT-C-1	246,953	36,683	3,401	433	40,517	206,436
COUT-C-2	246,964	36,683	3,403	432	40,518	206,445
COUT-C-3 (Agency Preferred Alternative)	246,937	36,682	3,403	436	40,522	206,415
COUT-C-4	246,983	36,682	3,403	436	40,521	206,462
COUT-C-5	246,956	36,682	3,403	422	40,507	206,449
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	253,017	37,111	3,412	413	40,936	212,081
COUT-I	339,386	45,263	5,122	809	51,195	288,191
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect shrub/shrub steppe vegetation communities are coal mining, a communication facility, habitat and rangeland management activities for the BLM Vernal Field Office, fuel treatments for the BLM Vernal Field Office, prescribed fires and spike treatments for the BLM Rawlins Field Office, the Sheep Creek Vegetation Management Area, vegetation treatments for the BLM Little Snake Field Office, prescribed fires for the BLM White River Field Office, historical wildland fires, pipelines, industrial development, a military training area, a missile launch facility, non-coal mining operations, oil and gas development, oil shale development, a power generation, an ATV trail, residential development, transportation projects, three wind-energy facilities, Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines), and BLM White River Field Office range improvement lines. RFFAs in the CIAA that would affect shrub/shrub steppe vegetation communities are a land annexation, coal mining, industrial development, a land division, oil and gas development, power generation projects, the TransWest Express Transmission Project, the Mona South transmission project, the Gateway West 500kV Transmission Project, a wind energy facility, and a Utah Department of Wildlife Resources watershed restoration focus area.

All impacts on shrub/shrub steppe vegetation communities from Project activities would co-occur with past and present actions or RFFAs to some degree, though Project-related impacts also occur would outside these areas with all alternative routes (Table 4-49). The extent of Project-related development in shrub/shrub steppe vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-49). All cumulative effects, including those from the Project, affect a moderate amount of the total extent of these vegetation communities in the CIAA (Table 4-49).

Water

The loss of water vegetation communities under Alternatives WYCO-B, WYCO-C, WYCO-D, WYCO-F, COUT BAX-B, COUT BAX-C, COUT BAX-E, COUT-A, COUT-B, and COUT-C would

contribute to the cumulative loss of water vegetation communities in the CIAA. The extent of cumulative development on water vegetation communities for all relevant alternative routes is summarized in Table 4-50.

TABLE 4-50 WATER VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	6,559	223	53	7	283	6,276
WYCO-B-1	6,559	223	53	7	284	6,275
WYCO-B-2 (Agency Preferred Alternative)	6,559	223	53	7	283	6,276
WYCO-B-3	6,559	223	53	7	283	6,276
Alternative WYCO-C and Route Variations						
WYCO-C	6,892	227	48	5	279	6,613
WYCO-C-1	6,892	227	48	5	280	6,613
WYCO-C-2	6,892	227	48	5	279	6,613
WYCO-C-3	6,892	227	48	5	279	6,613
Alternative WYCO-D and Route Variation						
WYCO-D	6,831	620	53	4	676	6,155
WYCO-D-1	6,831	620	53	4	676	6,155
Alternative WYCO-F and Route Variations						
WYCO-F	6,786	289	59	5	353	6,434
WYCO-F-1	6,786	289	59	5	353	6,433
WYCO-F-2	6,786	289	59	5	353	6,434
WYCO-F-3	6,786	289	59	5	353	6,434
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	4,098	845	74	4	922	3,176
COUT BAX-C	4,185	847	83	2	932	3,253
COUT BAX-E	4,570	745	70	2	817	3,753
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
Alternative COUT-A and Route Variation						
COUT-A	10,492	1,366	6	6	1,379	9,113
COUT-A-1	10,492	1,366	6	6	1,379	9,113
Alternative COUT-B and Route Variations						
COUT-B	4,044	816	10	5	831	3,214
COUT-B-1	3,593	810	9	5	823	2,769
COUT-B-2	3,593	810	9	5	823	2,770
COUT-B-3	3,621	811	10	5	825	2,796
COUT-B-4	3,633	812	10	5	826	2,807
COUT-B-5	3,581	809	9	5	822	2,759

TABLE 4-50 WATER VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	3,720	232	22	2	256	3,464
COUT-C-1	3,238	220	22	2	244	2,994
COUT-C-2	3,238	220	22	2	244	2,994
COUT-C-3 (Agency Preferred Alternative)	3,226	219	22	2	243	2,984
COUT-C-4	3,255	221	22	2	245	3,010
COUT-C-5	3,243	220	22	2	244	2,999
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	5,176	328	24	1	353	4,823
COUT-I	5,358	735	24	1	760	4,597
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect water vegetation communities are coal-mining operations, historical wildland fires, pipelines, noncoal mining operations, oil and gas development, oil shale development, residential development, residential development, Miller's Flat vegetation maintenance activities, prescribed fires for the BLM Rawlins Field Office, vegetation mechanical treatments and weed treatments for the BLM White River Field Office, two wind-energy facilities, and fences and water range improvement projects for the BLM White River Field Office. RFFAs in the CIAA that would affect water vegetation communities are coal mining, oil and gas development, a pipeline, power generation facilities, the TransWest Express Transmission Project, the Gateway West 500kV Transmission Project, a timber salvage project, a wind-energy facility, and Utah Department of Wildlife Resources watershed restoration focus areas.

All impacts on water vegetation communities from Project activities would co-occur with past and present actions or RFFAs to some degree, though Project-related impacts also would occur outside these areas with all alternative routes (Table 4-50). The extent of Project-related development in water vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-50). All cumulative effects, including those from the Project, impact a moderate portion of the total extent of these vegetation communities in the CIAA (Table 4-50).

Wetland

The loss of wetland vegetation communities under Alternatives WYCO-B, WYCO-C, WYCO-D, and WYCO-F would contribute to the cumulative loss of water vegetation communities in the CIAA. The extent of cumulative development on water vegetation communities for all relevant alternative routes is summarized in Table 4-51.

TABLE 4-51 WETLAND VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	10,862	1,031	483	26	1,540	9,322
WYCO-B-1	10,862	1,031	483	26	1,540	9,322
WYCO-B-2 (Agency Preferred Alternative)	10,862	1,031	483	26	1,540	9,322
WYCO-B-3	10,862	1,031	483	26	1,540	9,322
Alternative WYCO-C and Route Variations						
WYCO-C	11,358	1,010	461	31	1,502	9,855
WYCO-C-1	11,358	1,010	461	31	1,502	9,855
WYCO-C-2	11,358	1,010	461	31	1,502	9,855
WYCO-C-3	11,358	1,010	461	31	1,502	9,855
Alternative WYCO-D and Route Variation						
WYCO-D	15,126	5,514	404	22	5,940	9,186
WYCO-D-1	15,126	5,514	404	22	5,940	9,186
Alternative WYCO-F and Route Variations						
WYCO-F	12,003	1,119	538	26	1,682	10,321
WYCO-F-1	12,003	1,119	538	26	1,682	10,321
WYCO-F-2	12,003	1,119	538	26	1,682	10,321
WYCO-F-3	12,003	1,119	538	26	1,682	10,321
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	546	180	9	1	189	357
COUT BAX-C	553	182	8	1	192	362
COUT BAX-E	660	190	14	1	204	456
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
Alternative COUT-A and Route Variation						
COUT-A	7,688	6,174	14	4	6,192	1,496
COUT-A-1	7,688	6,174	14	4	6,192	1,496
Alternative COUT-B and Route Variations						
COUT-B	7,137	5,232	40	10	5,283	1,855
COUT-B-1	7,010	5,228	40	10	5,279	1,731
COUT-B-2	7,059	5,228	40	10	5,279	1,780
COUT-B-3	7,091	5,229	40	10	5,280	1,811
COUT-B-4	7,092	5,229	40	10	5,280	1,812
COUT-B-5	7,058	5,228	40	11	5,279	1,778

TABLE 4-51 WETLAND VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	306	46	1	0	47	259
COUT-C-1	168	37	1	0	38	130
COUT-C-2	217	37	1	0	38	179
COUT-C-3 (Agency Preferred Alternative)	216	37	1	0	38	178
COUT-C-4	240	37	1	0	38	201
COUT-C-5	238	37	1	0	38	200
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	273	61	1	0	62	211
COUT-I	272	91	3	0	94	178
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect wetland vegetation communities are coal mining, historical wildland fires, oil and gas development, prescribed fires and spike treatments for the BLM Rawlins Field Office, and two wind-energy facilities. RFFAs in the CIAA that would affect wetland vegetation communities are coal mining, oil and gas development, the TransWest Express Transmission Project, the Gateway West 500kV Transmission Project, and a wind-energy facility.

All impacts on wetland vegetation communities from Project activities would co-occur with past and present actions or RFFAs to some degree, though Project-related impacts also would occur outside these areas with all alternative routes (Table 4-51). The extent of Project-related development in wetland vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-51). All cumulative effects, including those from the Project, impact a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-51).

4.3.6 Special Status Plants

This section addresses cumulative effects on special status plant resources resulting from the Project in addition to other past and present actions and RFFAs. Resources addressed in this section are the same as those described in Section 3.2.6.

The approach for analysis of cumulative effects on special status plants, including the geographic and temporal scopes of analysis, is presented in Table 4-3. The cumulative effects analysis for special status plants considers past and present actions and RFFAs (Tables 4-1 and 4-2) in conjunction with direct and indirect impacts from the Project (described in Section 3.2.6.4.3).

The geographic scope of the CIAA for an alternative that crosses special status plant habitat is the extent of subwatersheds (12-digit HUCs) crossed by the alternative routes considered. The analysis area is

sufficient to analyze all potential cumulative effects of the Project on federally listed or candidate species; however, sufficient habitat and occurrence data are not available for USFS- and BLM-listed sensitive species and, therefore, quantitative analysis of cumulative impacts on these species is not possible for the purposes of this EIS.

Most direct cumulative impacts on special status plants associated with construction of the Proposed Action would occur in the immediate geographical area of construction activities for access roads, tower structures, and ancillary facilities. However, some anticipated direct and indirect effects (described in Section 3.2.6.4.3), such as the introduction and spread of noxious weed species and increased dust deposition, could occur in a larger geographical context as well as in the immediate vicinity of construction activities.

The temporal scope of the analysis includes 5 years for impacts associated with Project construction and site stabilization. The Proposed Action does not include plans to decommission the Project; therefore, the temporal scope of analysis for impacts associated with operation and maintenance of the Project is based on the assumption that the effects of operating and maintaining the transmission line would persist for the life of the Project (50 years or longer). Because the Proposed Action does not include decommissioning (refer to Section 2.4.9), long-term impacts associated with the presence of the transmission line (e.g., tower foundations) may be permanent.

4.3.6.1 Issues Identified for Analysis

4.3.6.1.1 Loss and Degradation of Habitat for Special Status Plant Species

Loss of special status plant habitat was identified as an issue warranting analysis by the agencies and public during scoping (Table 4-3). Loss of special status plant habitat could occur with construction of access roads, tower structures, and ancillary facilities of constructed in these areas. Loss of habitat for special status plant species is more likely to negatively affect a species if impacts are extensive, occur over a significant portion of available habitat, or affect patchy or isolated populations. Cumulative loss of habitat are analyzed qualitatively for all special status species and quantitatively for federally listed, candidate, and proposed species in Section 4.3.6.5.

4.3.6.1.2 Long-term Sustainability of Special Status Plant Populations

Negative impacts on long-term sustainability of special status plant populations was identified as an issue relating to special status plant resources by the agencies and during public scoping (Table 4-3). Long-term sustainability of some special status plant populations could be threatened through cumulative detrimental direct and indirect impacts of past and present actions and RFFAs to populations and potential habitat. Impacts on habitat could result in habitat fragmentation, which could limit gene flow between populations, decrease genetic diversity in populations, and potentially negatively impact population long-term viability (Ellstrand and Elam 1993). These impacts could be particularly threatening to long-term sustainability of special status plant resources if impacts are extensive, occur over a significant portion of available habitat, or affect populations that are already especially patchy or isolated. Cumulative impacts on habitat for special status plants are analyzed in terms of direct impacts on special status plant habitat (i.e., decrease in extent [in acres] of habitat) and discussed quantitatively in Section 4.3.6.5.

4.3.6.2 Existing Condition

Conversion of native vegetation to agricultural use since settlement of European peoples in the area in the middle of the 19th century has significantly affected the character of landscapes and the quantity and quality of habitats for special status plants in the CIAA. Construction of settlements and transportation systems as well as human population growth have resulted in further conversion of habitats for plants and animals and significant shifts in the abundance and distribution of species of the area. Drought, wildfire,

climate change, introduction of noxious weeds, and anthropogenic disturbance have likewise resulted in changes to habitats in more recent times.

Cumulative effects analysis and results are based on the best available species-specific habitat information. Descriptions of existing conditions of special status plants are provided in Section 3.2.5.5. Species accounts for special status plant species are presented in Appendix E.

4.3.6.3 Results

Direct loss of special status plant habitat could result from ground-disturbing activities or construction of permanent or temporary features. Indirect negative impacts on habitat (i.e., habitat degradation) also could occur where disturbance is adjacent to habitat but does not affect it directly. Degradation could be a result of many factors, including changes to erosional patterns, dust deposition from increased traffic, decreased attractiveness of the area to pollinators, and noxious weed invasion (refer to Section 3.2.5.4 for more detailed information).

Past actions in the CIAA, such as residential development, mining operations, oil and gas development, pipelines, and oil shale and tar sands development have resulted in the loss or degradation of special status plant habitat. Unsustainable grazing practices and other soil-disturbing activities, as well as transport of weed seeds via human and livestock movement, also have likely resulted in large-scale invasion of this area by noxious and invasive weeds. Present actions also are likely to result in loss or degradation of special status plant habitat, though it is assumed that selective mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Inadvertent habitat degradation in areas adjacent to ground-disturbing actions also are likely to occur with present actions, even though selective mitigation measures to minimize these impacts would be required on federal land.

Construction of Project features such as access roads, transmission towers, and ancillary facilities would require the permanent removal of vegetation and could result in the loss of potential habitat for special status plants under all action alternative routes. Non-native plant species are likely to colonize new areas through the transport of seeds by construction and maintenance equipment. Revegetation of disturbed areas is a project design feature for environmental protection (refer to Table 2-8, Design Feature 2); however, it is unlikely that disturbed areas could be restored to pre-disturbance conditions. As site-specific Project-related impacts on habitats and populations of BLM- and USFS-listed sensitive species are not known, it is not possible to quantify cumulative effects on these species. However, it is assumed that application of Design Features 3 and 9 of the Proposed Action for environmental protection (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) would minimize disturbance to special status plant species habitat and populations. Impacts on habitat for special status plants, however minimal, would contribute incrementally to losses of special status plant habitat that have occurred or could occur in the CIAA. RFFAs that require the construction of long-term or permanent Project structures or that introduce non-native plant species also would be likely to result in changes to vegetation community structure and the degradation of potential habitat for special status plants.

Quantitative analysis of cumulative effects on special status plant resources was completed through an inventory of available habitat for each species and an estimation of impacts in these habitats by past and present actions and the Proposed Action and other RFFAs. The extent of special status plant habitats (in acres) in the CIAA was determined using information provided by land-management agencies. Development associated with past and present actions and RFFAs was estimated using shapefiles of specific projects received from agencies and local governments. Incremental project development was estimated using assumptions of extent of disturbance per mile of alternative as described in Section 2.5.1.2.

Predicted cumulative effects were analyzed for species to which direct impacts would be anticipated to occur with implementation of any action alternative considered (refer to Section 3.2.6). The results of this analysis are presented by species.

4.3.6.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

WYCO alternative routes and route variations would only cross habitat for Ute ladies'-tresses.

Ute Ladies'-tresses

The incremental project-related impacts resulting in loss, fragmentation and modification of Ute ladies'-tresses habitat under all WYCO alternative routes would contribute to the cumulative loss, fragmentation, and modification of Ute ladies'-tresses habitat. The extent of cumulative development on Ute ladies'-tresses habitat is summarized in Table 4-52.

TABLE 4-52 UTE LADIES'-TRESSES HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	1,540	269	58	1	328	1,212
WYCO-B-1	1,540	269	58	1	328	1,212
WYCO-B-2 (Agency Preferred Alternative)	1,540	269	58	1	328	1,212
WYCO-B-3	1,540	269	58	1	328	1,212
Alternative WYCO-C and Route Variations						
WYCO-C	1,365	268	49	1	318	1,047
WYCO-C-1	1,365	268	49	1	318	1,047
WYCO-C-2	1,365	268	49	1	318	1,047
WYCO-C-3	1,365	268	49	1	318	1,047
Alternative WYCO-D and Route Variation						
WYCO-D	4,801	1,193	190	12	1,395	3,406
WYCO-D-1	4,801	1,193	190	12	1,395	3,406
Alternative WYCO-F and Route Variations						
WYCO-F	3,194	387	137	5	529	2,665
WYCO-F-1	3,194	387	137	5	529	2,665
WYCO-F-2	3,194	387	137	5	529	2,665
WYCO-F-3	3,194	387	137	5	529	2,665
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA for all WYCO alternative routes and route variations that would affect Ute ladies'-tresses potential habitat are coal-mining operations, historical wildland fires, the Atlantic Rim oil and gas field, BLM Little Snake and White River Field Office oil and gas units, Colorado and Wyoming state lands oil and gas leases, prescribed fires and spike treatments for the BLM Rawlins Field Office, vegetation treatments for the BLM Little Snake Field Office, the expansion of the

Chokecherry Wind Farm, construction of the Seven Mile Hill Wind Energy Facility, Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences, cattle guards, gates, waterlines), and BLM White River Field Office range improvement projects.

RFFAs in the CIAA for Ute ladies'-tresses potential habitat are coal-mining operations, the Continental Divide-Creston Junction oil and gas project, the construction of the TransWest Express and the Gateway West transmission projects, and the Hogback Ridge wind-energy project.

The incremental project-related development in Ute ladies'-tresses potential habitat would account for only a minor portion (between 1 and 12 acres) of the total cumulative effects predicted in the CIAA for the WYCO alternative routes considered (Table 4-53).

4.3.6.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Potential habitat for Ute ladies'-tresses and Cisco milkvetch is crossed by all COUT BAX alternative routes. San Rafael cactus habitat is crossed by Alternative COUT BAX-C.

Ute Ladies'-tresses

The incremental project-related impacts resulting in loss, fragmentation, and modification of Ute ladies'-tresses habitat under all COUT BAX alternative routes would contribute to the cumulative loss, fragmentation, and modification of Ute ladies'-tresses habitat in the CIAA. The extent of cumulative development in Ute ladies'-tresses habitat is summarized in Table 4-53.

TABLE 4-53 UTE LADIES'-TRESSES HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	2,919	928	11	12	951	1,968
COUT BAX-C	3,428	945	472	12	1,429	1,999
COUT BAX-E	4,119	643	528	13	1,184	2,935
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA for all COUT BAX alternative routes that would affect Ute ladies'-tresses potential habitat are coal-mining operations, the Central Utah Telephone Fiber Optic Line, historical wildland fires, SITLA active humic shale, metalliferous mineral, and potash leases, BLM Grand Junction, Moab, and White River Field Office active oil and gas extraction leases, SITLA active oil and gas extraction leases, the Ferron natural gas project, Enterprise Mid-America pipelines, residential development, vegetation management and weed treatment activities for the BLM White River Field Office, fuel treatments for the BLM Vernal Field Office, and range improvement projects for the BLM White River Field Office.

RFFAs in the CIAA for all COUT BAX alternative routes that would affect Ute ladies'-tresses potential habitat are a diversion dam, Golden Eagle, LLC oil and gas development, Twin Bridges Resources oil and gas development, the Narrows Proposed East Bench and Oak Creek pipeline, the Woodside power generation facility, the construction of the TransWest Express Transmission Project, and UDWR watershed restoration focus areas.

The incremental project-related development in Ute ladies'-tresses potential habitat would account for only a minor portion (between 12 and 13 acres) of the total cumulative effects predicted in the CIAA for the COUT BAX alternative routes considered (Table 4-52).

Cisco Milkvetch

The incremental project-related impacts resulting in loss, fragmentation, and modification of Cisco milkvetch habitat under Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E would contribute to the cumulative loss, fragmentation, and modification of Cisco milkvetch habitat in the CIAA. The extent of cumulative development in Cisco milkvetch habitat for the relevant alternative routes and route variations is summarized in Table 4-54.

TABLE 4-54 CISCO MILKVETCH HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	146,502	4,056	914	489	5,459	141,043
COUT BAX-C	146,502	4,056	914	480	5,451	141,052
COUT BAX-E	146,502	4,056	914	466	5,436	141,066
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA for all COUT BAX alternative routes that would affect Cisco milkvetch habitat are historical wildland fires, SITLA active humic shale and potash leases, BLM Moab Field Office oil and gas units, SITLA active oil and gas extraction leases, and Enterprise Mid-America pipelines.

The only RFFAs in the CIAA for COUT BAX alternative routes that would affect Cisco milkvetch habitat are the construction of the TransWest Express Transmission Project and UDWR watershed restoration focus areas.

The incremental project-related development in Cisco milkvetch habitat would account for a moderate portion (between 466 and 489 acres) of the total cumulative effects predicted in the CIAA for the COUT BAX alternative routes considered (Table 4-54).

San Rafael Cactus

Alternative COUT BAX-C is the only Project alternative that crosses San Rafael cactus habitat. Impacts on San Rafael cactus habitat under Alternative COUT BAX-C would not contribute to the cumulative loss, fragmentation, and modification of San Rafael cactus habitat in the CIAA for this alternative, as all areas where the Project would affect habitat for this species are in the extent of past and present actions and RFFAs (Table 4-55). The extent of cumulative development on San Rafael cactus habitat for all relevant alternative routes is summarized in Table 4-55.

TABLE 4-55 SAN RAFAEL CACTUS HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-C	3,865	74	22	0	96	3,769
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Rather than past and/or present projects, development in the CIAA for Alternative COUT BAX-C that would affect San Rafael cactus habitat is attributed to roads and other infrastructure occurring in habitat for this species.

RFFAs in the CIAA for Alternative COUT BAX-C that would affect San Rafael cactus habitat are the construction of the TransWest Express Transmission Project and UDWR watershed restoration focus areas.

All project development in San Rafael cactus habitat in the CIAA would occur in the same geographic areas of past or present actions or other RFFAs, with the majority being in the watershed restoration focus area. Therefore, no incremental Project-related development would be anticipated in San Rafael cactus habitat in the CIAA for Alternative COUT BAX-C.

4.3.6.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Ute ladies'-tresses potential habitat are crossed by all COUT alternative routes and route variations. Clay phacelia habitat are crossed by Alternatives COUT-A, COUT-B, and COUT-C and route variations. Clay reed-mustard and Uinta Basin hookless cactus habitat (as well as Levels 1 and 2 *Sclerocactus* core habitat) are crossed by Alternatives COUT-C and its route variations, COUT-H, and COUT-I. Graham's beardtongue and White River beardtongue habitat are crossed by Alternatives COUT-B and its route variations, COUT-C and its route variations, COUT-H, and COUT-I.

Ute Ladies'-tresses

The incremental Project-related impacts resulting in loss, fragmentation, and modification of Ute ladies'-tresses habitat under all COUT alternative routes and route variations would contribute to the cumulative loss, fragmentation, and modification of Ute ladies'-tresses habitat in the CIAA for these alternative routes. The extent of cumulative development on Ute ladies'-tresses habitat is summarized in Table 4-56.

TABLE 4-56 UTE LADIES’-TRESSES HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	7,918	3,320	83	31	3,435	4,483
COUT-A-1	7,918	3,320	83	31	3,435	4,483

TABLE 4-56 UTE LADIES'-TRESSES HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-B and Route Variations						
COUT-B	7,651	2,593	133	28	2,754	4,897
COUT-B-1	7,613	2,590	132	28	2,751	4,862
COUT-B-2	7,613	2,590	132	28	2,751	4,862
COUT-B-3	7,613	2,590	132	28	2,751	4,862
COUT-B-4	7,613	2,590	132	28	2,751	4,862
COUT-B-5	7,613	2,590	132	29	2,752	4,861
Alternative COUT-C and Route Variations						
COUT-C	3,298	630	18	11	658	2,639
COUT-C-1	3,234	626	17	11	654	2,580
COUT-C-2	3,234	626	17	11	654	2,580
COUT-C-3 (Agency Preferred Alternative)	3,234	626	17	11	654	2,580
COUT-C-4	3,234	626	17	11	654	2,580
COUT-C-5	3,234	626	17	11	654	2,580
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	2,750	575	13	7	595	2,156
COUT-I	3,768	888	29	11	927	2,841
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The largest extent of potential habitat for Ute-ladies’-tresses occurs in the cumulative effects analysis areas of Alternatives COUT-A and COUT-B and route variations. Lesser extents of potential habitat for Ute-ladies’-tresses occur in the cumulative effects analysis areas of Alternatives COUT-C and its route variations, COUT-H, and COUT-I.

Past and present activities in the CIAA for all COUT alternative routes and route variations that would affect Ute ladies’-tresses potential habitat are coal-mining operations, the Central Utah Telephone fiber optic line, habitat and rangeland management activities, historical wildland fires, two pipelines, gilsonite mining, SITLA active limestone and metalliferous mineral leases, BLM Vernal Field Office oil and gas units, Chapita Wells/Stagecoach oil and gas units, Greater Deadman Bench oil and gas units, Greater Natural Buttes Area gas development project oil and gas units, Gusher Oil & Gas project oil and gas units, Lake Canyon Exploration and Development Agreement (EDA) oil and gas units, Colorado state land oil and gas leases, Utah Division of Oil, Gas and Mining (UDOGM) oil well pads, recreation management activities, residential development, Sheep Creek Vegetation Management activities, Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences, cattle guards, gates, waterlines), and BLM White River Field Office range improvement projects.

RFFAs in the CIAA that would affect Ute ladies’-tresses potential habitat are the Kerr-McGee oil and gas development, Monument Butte oil and gas development, a diversion dam, Narrows Proposed East Bench

and Oak Creek Pipeline, industrial development, the construction of the TransWest Express Transmission Project, and UDWR watershed restoration focus areas.

The incremental Project-related development in potential habitat for Ute ladies'-tresses would account for only a minor portion (between 7 and 31 acres) of the total cumulative effects predicted in the CIAA for the COUT alternative routes considered (Table 4-56).

Clay Phacelia

Alternatives COUT-A, COUT-B, and COUT-C and route variations cross clay phacelia habitat. Impacts on clay phacelia habitat under Alternatives COUT-A, COUT-B, and COUT-C and route variations would not contribute to the cumulative loss, fragmentation, and modification of clay phacelia habitat in the CIAA for these alternative routes and route variations, as all areas where the Project would affect habitat for this species are in the extent of past and present actions and RFFAs. The extent of cumulative development on clay phacelia habitat for all relevant alternative routes and route variations is summarized in Table 4-57.

TABLE 4-57 CLAY PHACELIA HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	535	125	5	0	129	405
COUT-A-1	535	125	5	0	129	405
Alternative COUT-B and Route Variations						
COUT-B	1,283	253	29	1	283	1,000
COUT-B-1	1,283	253	29	1	283	1,000
COUT-B-2	1,283	253	29	1	283	1,000
COUT-B-3	1,283	253	29	1	283	1,000
COUT-B-4	1,283	253	29	1	283	1,000
COUT-B-5	1,283	253	29	1	283	1,000
Alternative COUT-C and Route Variations						
COUT-C	1,283	253	29	1	283	1,000
COUT-C-1	1,283	253	29	1	283	1,000
COUT-C-2	1,283	253	29	1	283	1,000
COUT-C-3 (Agency Preferred Alternative)	1,283	253	29	1	283	1,000
COUT-C-4	1,283	253	29	1	283	1,000
COUT-C-5	1,283	253	29	1	283	1,000
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA for these alternative routes and route variations that would affect clay phacelia habitat are the Sheep Creek vegetation management area, historic wildland fires, and Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences, waterlines, stream crossings, troughs).

The RFFAs in the CIAA that would affect clay phacelia habitat are the construction of the TransWest Express Transmission Project and UDWR watershed restoration focus areas.

Most Project development in clay phacelia habitat in the CIAA would occur in the same geographic areas of past or present actions or other RFFAs, with the majority being in the Sheep Creek vegetation management area for the Manti-La Sal National Forest. Therefore, incremental Project-related development anticipated in clay phacelia habitat in the CIAA for any COUT alternative route would be minor.

Clay Reed-mustard

The incremental Project-related impacts resulting in loss, fragmentation, and modification of clay reed-mustard habitat under Alternatives COUT-C and its route variations, COUT-H, and COUT-I would contribute to the cumulative loss, fragmentation, and modification of clay reed-mustard habitat in the CIAA for this species. The extent of cumulative development on clay reed-mustard habitat for all relevant alternative routes and route variations is summarized in Table 4-58.

TABLE 4-58 CLAY REED-MUSTARD HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	9,148	227	21	13	261	8,887
COUT-C-1	9,148	227	21	13	261	8,887
COUT-C-2	9,148	227	21	13	261	8,887
COUT-C-3 (Agency Preferred Alternative)	9,148	227	21	13	261	8,887
COUT-C-4	9,148	227	21	13	261	8,887
COUT-C-5	9,148	227	21	13	261	8,888
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	9,148	227	21	13	260	8,888
COUT-I	9,148	227	21	13	260	8,888
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect clay reed-mustard habitat are BLM Vernal Field Office oil and gas units, Gasco oil and gas development, Greater Natural Buttes area gas development, Riverbend Unit infill oil and gas units, SITLA active oil and gas leases, UDOGM gas well pads, and gilsonite mining operations.

The only RFFA in the CIAA for these alternative routes and route variations that would affect clay reed-mustard habitat is the construction of the TransWest Express Transmission Project.

The incremental Project-related development in clay reed-mustard habitat would account for only a minor portion (13 acres) of the total cumulative effects predicted in the CIAA for the COUT alternative routes and route variations considered (Table 4-58).

Graham's Beardtongue

The incremental Project-related impacts resulting in loss, fragmentation, and modification of Graham's beardtongue habitat under Alternatives COUT-B and its route variations, COUT-C and its route variations, COUT-H, and COUT-I would contribute to the cumulative loss, fragmentation, and modification of Graham's beardtongue habitat. The extent of cumulative development on Graham's beardtongue habitat for all relevant alternative routes and route variations is summarized in Table 4-59.

TABLE 4-59 GRAHAM'S BEARDTONGUE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-B and Route Variations						
COUT-B	38,005	7,671	616	0	8,287	29,718
COUT-B-1	50,459	7,978	510	16	8,503	41,956
COUT-B-2	50,459	7,978	510	0	8,487	41,972
COUT-B-3	38,005	7,671	616	0	8,287	29,718
COUT-B-4	52,493	8,243	619	0	8,862	43,631
COUT-B-5	35,971	7,406	507	0	7,913	28,059
Alternative COUT-C and Route Variations						
COUT-C	89,588	5,373	251	116	5,741	83,848
COUT-C-1	125,936	12,579	536	170	13,285	112,651
COUT-C-2	125,936	12,579	536	154	13,268	112,668
COUT-C-3 (Agency Preferred Alternative)	111,448	12,007	533	155	12,695	98,754
COUT-C-4	104,076	5,945	254	118	6,317	97,759
COUT-C-5	89,588	5,373	251	114	5,739	83,850
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	89,324	5,366	230	112	5,708	83,616
COUT-I	89,324	5,366	230	110	5,706	83,618
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect Graham's beardtongue habitat include habitat management projects for the BLM Vernal Field Office, historic wildland fires, SITLA active metalliferous mineral leases and mineral materials permits, Berry Petroleum South Unit oil and gas development, BLM Price, Vernal, and White River Field Office oil and gas units, Gasco oil and gas units, Lake Canyon EDA oil and gas units, Rye Patch oil drilling project oil and gas development, SITLA active oil and gas and oil shale leases, West Tavaputs Plateau oil and gas development, Red Leaf Oil Shale Project development, residential development, fuel treatments for the BLM Vernal Field Office, and BLM White River Field Office range improvement projects.

The RFFAs in the CIAA that would affect Graham’s beardtongue habitat are the construction of the TransWest Express Transmission Project and UDWR watershed restoration focus areas.

All Project-related development in habitat for this species due to Alternative COUT-B and Route Variations COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 would occur in areas already disturbed or planned for development. Therefore, no incremental Project-related development would be anticipated in Graham’s beardtongue habitat in the CIAA for this alternative route or these route variations (Table 4-59).

The incremental Project-related development in Graham’s beardtongue habitat would account for only a minor portion (16 to 170 acres) of the total cumulative effects predicted in the CIAA for Route Variation COUT-B-1, as well as alternatives COUT-C and its route variations, COUT-H, and COUT-I (Table 4-59).

Uinta Basin Hookless Cactus

The loss, fragmentation and modification of Uinta Basin hookless cactus habitat under Alternatives COUT-C and its route variations, COUT-H, and COUT-I would contribute to the cumulative loss, fragmentation, and modification of Uinta Basin hookless cactus habitat. The extent of cumulative development on Uinta Basin hookless cactus habitat for all relevant alternative routes and route variations is summarized in Table 4-60.

TABLE 4-60 UINTA BASIN HOOKLESS CACTUS HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	223,055	34,523	2,992	237	37,753	185,302
COUT-C-1	223,055	34,523	2,992	239	37,755	185,300
COUT-C-2	223,055	34,523	2,992	239	37,754	185,301
COUT-C-3 (Agency Preferred Alternative)	223,055	34,523	2,992	241	37,756	185,299
COUT-C-4	223,055	34,523	2,992	241	37,756	185,299
COUT-C-5	223,055	34,523	2,992	233	37,749	185,306
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	223,055	34,523	2,992	228	37,744	185,311
COUT-I	223,055	34,523	2,992	225	37,740	185,315
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect Uinta Basin hookless cactus habitat are gilsonite mining operations, SITLA active metalliferous mineral leases, BLM Vernal Field Office oil and gas units, Chapita Wells/Stagecoach oil and gas development, North Chapita Wells oil and gas development, Gasco oil and gas development, Greater Deadman Bench oil and gas development, Greater Natural Buttes area gas development, North Alger oil and gas development, Riverbend Unit infill oil and gas development, SITLA active oil and gas and oil shale leases, the Red Leaf oil shale project, the Peter’s Point Loop

pipeline, and the Seep Ridge Road paving project. RFFAs in the CIAA that would affect Uinta Basin hookless cactus habitat are the construction of the TransWest Express Transmission Project, Monument Butte EIS oil and gas development, Kerr-McGee oil and gas development, and Utah Department of Wildlife Resources watershed restoration focus areas.

The incremental Project-related development in Uinta Basin hookless cactus habitat would account for a moderate portion (between 244 and 262 acres) of the total cumulative effects predicted in the CIAA for the COUT alternative routes and route variations considered (Table 4-60).

Level 1 (400-Meter) *Sclerocactus* Core Habitat

The loss, fragmentation and modification of Level 1 *Sclerocactus* core habitat under Alternatives COUT-C and its route variations, COUT-H, and COUT-I would contribute to the cumulative loss, fragmentation, and modification of Level 1 *Sclerocactus* core habitat. The extent of cumulative development on Level 1 *Sclerocactus* core habitat for all relevant alternative routes is summarized in Table 4-61.

TABLE 4-61 LEVEL 1 SCLEROCACTUS CORE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	20,564	3,072	259	31	3,362	17,202
COUT-C-1	20,564	3,072	259	31	3,362	17,202
COUT-C-2	20,564	3,072	259	31	3,362	17,202
COUT-C-3 (Agency Preferred Alternative)	20,564	3,072	259	32	3,362	17,202
COUT-C-4	20,564	3,072	259	32	3,362	17,202
COUT-C-5	20,564	3,072	259	31	3,361	17,203
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	20,564	3,072	259	30	3,361	17,204
COUT-I	20,564	3,072	259	29	3,360	17,204
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA for Level 1 *Sclerocactus* core habitat are gilsonite mining operations, SITLA active metalliferous mineral leases, BLM Vernal Field Office oil and gas units, Chapita Wells/Stagecoach oil and gas development, North Chapita Wells oil and gas development, Gasco oil and gas development, Greater Natural Buttes area gas development, Riverbend Unit infill oil and gas development, SITLA active oil and gas and oil shale leases, and UDOGM gas well pads. RFFAs in the CIAA for Uinta Basin hookless cactus are the construction of the TransWest Express Transmission Project, Monument Butte EIS oil and gas development, Kerr-McGee oil and gas development, and Utah Department of Wildlife Resources watershed restoration focus areas.

The incremental Project-related development in Level 1 *Sclerocactus* core habitat would account for only a minor portion (29 to 32 acres) of the total cumulative effects predicted in the CIAA for Alternatives COUT-C and its route variations, COUT-H, and COUT-I (Table 4-61).

The FWS has recommended that Level 1 *Sclerocactus* core habitat areas be managed to exclude additional ground disturbance (FWS *Sclerocactus* document). The Project and other RFFAs would result in additional ground disturbance in Level 1 *Sclerocactus* core habitat areas and would therefore not be consistent with FWS management recommendations. The effects of the Project and other RFFAs would contribute approximately 9 percent (288 to 291 acres) of the total estimated cumulative ground disturbance in Level 1 *Sclerocactus* core habitat areas, and ground disturbance resulting from the Project would only be a minor component (29 to 32 acres; approximately 11 percent) of the disturbance resulting from all RFFAs.

The methods used to evaluate ground disturbance in *Sclerocactus* core habitats may overestimate the amount of ground disturbance in the CIAA from the Project and other past and present actions and RFFAs. All actions in Level 1 *Sclerocactus* core habitat areas would be managed to minimize effects on individual cacti and their habitats. Micrositing of Project features and other selective mitigation measures as described in Sections 3.2.6.4.3 and 3.2.6.5.4 and would minimize impacts in Level 1 *Sclerocactus* core areas.

Level 2 (1,000-Meter) *Sclerocactus* Core Habitat

The loss, fragmentation and modification of Level 2 *Sclerocactus* core habitat under Alternatives COUT-C and its route variations, COUT-H, and COUT-I would contribute to the cumulative loss, fragmentation, and modification of Level 2 *Sclerocactus* core habitat. The extent of cumulative development on Level 2 *Sclerocactus* core habitat for all relevant alternative routes and route variations is summarized in Table 4-62.

TABLE 4-62 LEVEL 2 SCLEROCACTUS CORE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	65,353	9,775	610	71	10,456	54,897
COUT-C-1	65,353	9,775	610	72	10,457	54,896
COUT-C-2	65,353	9,775	610	72	10,456	54,897
COUT-C-3 (Agency Preferred Alternative)	65,353	9,775	610	72	10,457	54,896
COUT-C-4	65,353	9,775	610	72	10,457	54,896
COUT-C-5	65,353	9,775	610	70	10,455	54,898

TABLE 4-62 LEVEL 2 SCLEROCACTUS CORE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	65,353	9,775	610	68	10,453	54,900
COUT-I	65,353	9,775	610	67	10,452	54,901
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA for Level 2 *Sclerocactus* core habitat are gilsonite mining operations, SITLA active metalliferous mineral leases, BLM Vernal Field Office oil and gas units, Chapita Wells/Stagecoach oil and gas development, North Chapita Wells oil and gas development, Gasco oil and gas development, Greater Deadman Bench oil and gas development, Greater Natural Buttes area gas development, Riverbend Unit infill oil and gas development, SITLA active oil and gas and oil shale leases, and UDOGM gas well pads. RFFAs in the CIAA for Uinta Basin hookless cactus are the construction of the TransWest Express Transmission Project, Monument Butte EIS oil and gas development, Kerr-McGee oil and gas development, and Utah Department of Wildlife Resources watershed restoration focus areas.

The incremental Project-related development in Level 2 *Sclerocactus* core habitat would account for only a minor portion (67 to 72 acres) of the total cumulative effects predicted in the CIAA for Alternatives COUT-C and its route variations, COUT-H, and COUT-I (Table 4-62).

FWS has recommended that total ground disturbance in Level 2 *Sclerocactus* core habitat areas be maintained at or below 5 percent and that no additional ground disturbance occur if total (unreclaimed) disturbance exceeds this limit (FWS *Sclerocactus* document). Disturbance from past and present actions accounts for approximately 15 percent (9,775 acres) of total surface area in Level 1 *Sclerocactus* core habitat areas and, therefore, actions of the Project and other RFFAs would not be consistent with FWS management recommendations in these areas. The effects of the Project and other RFFAs would contribute approximately 7 percent (677 to 682 acres) of the total estimated cumulative ground disturbance in Level 2 *Sclerocactus* core habitat areas, and ground disturbance resulting from the Project would only be a minor component (67 to 72 acres; approximately 10 percent) of the disturbance resulting from all RFFAs.

The methods used to evaluate ground disturbance in *Sclerocactus* core habitats may overestimate the amount of ground disturbance in the CIAA from the Project and other past and present actions and RFFAs. All actions in Level 2 *Sclerocactus* core habitat areas would be managed to minimize effects on individual cacti and their habitats. Micrositing of Project features and other selective mitigation measures as described in Sections 3.2.6.4.3 and 3.2.6.5.4 and would minimize impacts in Level 2 *Sclerocactus* core areas.

White River Beardtongue

The loss, fragmentation and modification of White River beardtongue habitat under Alternatives COUT-B and its route variations, COUT-C and its route variations, COUT-H, and COUT-I would

contribute to the cumulative loss, fragmentation, and modification of White River beardtongue habitat. The extent of cumulative development on White River beardtongue habitat for all relevant alternative routes and route variations is summarized in Table 4-63.

TABLE 4-63 WHITE RIVER BEARDTONGUE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-B and Route Variations						
COUT-B	38,005	7,671	616	0	8,287	29,718
COUT-B-1	50,459	7,978	510	16	8,503	41,956
COUT-B-2	50,459	7,978	510	0	8,487	41,972
COUT-B-3	38,005	7,671	616	0	8,287	29,718
COUT-B-4	52,493	8,243	619	0	8,862	43,631
COUT-B-5	35,971	7,406	507	0	7,913	28,059
Alternative COUT-C and Route Variations						
COUT-C	89,531	5,395	251	118	5,764	83,767
COUT-C-1	125,879	12,600	536	171	13,308	112,571
COUT-C-2	125,879	12,600	536	155	13,291	112,588
COUT-C-3 (Agency Preferred Alternative)	111,391	12,028	533	156	12,718	98,673
COUT-C-4	104,019	5,967	254	119	6,340	97,679
COUT-C-5	89,531	5,395	251	115	5,761	83,769
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	89,266	5,387	230	113	5,731	83,536
COUT-I	89,266	5,387	230	111	5,729	83,537
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect White River beardtongue habitat include habitat management projects for the BLM Vernal Field Office, SITLA active metalliferous mineral leases and mineral materials permits, Berry Petroleum South Unit oil and gas development, BLM Price, Vernal, and White River Field Office oil and gas units, Gasco oil and gas units, Lake Canyon EDA oil and gas units, Rye Patch oil drilling project oil and gas development, SITLA active oil and gas and oil shale leases, West Tavaputs Plateau oil and gas development, Red Leaf Oil Shale Project development, residential development, fuel treatments for the BLM Vernal Field Office, and BLM White River Field Office range improvement projects.

The RFFAs in the CIAA that would affect White River beardtongue habitat are the construction of the TransWest Express Transmission Project and UDWR watershed restoration focus areas.

All Project-related development in habitat for this species due to Alternative COUT-B and Route Variations COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 would occur in areas already disturbed

or planned for development. Therefore, no additional development would be incurred in White River beardtongue potential habitat by the Project for these alignments (Table 4-63).

The incremental Project-related development in White River beardtongue habitat would account for only a minor portion (16 to 171 acres) of the total cumulative effects predicted in the CIAA for Alternative Route Variation COUT-B-1, COUT-C and its route variations, COUT-H, and COUT-I (Table 4-63).

4.3.7 Wildlife

The section addresses potential cumulative effects on wildlife resources resulting from the Project in addition to past, other present, and RFFAs. Resources addressed in this section are the same as those described in Section 3.2.7.

The approach for analysis of cumulative effects on wildlife resources, including the geographic and temporal scopes of analysis, is presented in Table 4-3. The cumulative effects analysis for wildlife considers direct and indirect impacts from the Project (described in Section 3.2.7) in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2. Crucial and severe habitat data were used to assess cumulative effects on big game, and were obtained from WGFD, CPW, and UDWR (Table 4-64). For wildlife species with limited data available for analysis that could occur in the Project area, a qualitative evaluation of the potential cumulative effects was performed. For information regarding species life history and a list of migratory birds that potentially occur in the Project area that support the analysis of cumulative effects, refer to Section 3.2.7.4 and Appendix E.

The geographic scope for detailed analysis of cumulative effects on wildlife resources is identified by species in Table 4-64. CIAAs were established for wildlife species based on the best available information regarding species specific home range or territory sizes.

4.3.7.1 Issues Identified for Analysis

4.3.7.1.1 Cumulative Impacts on Big Game Crucial and Severe Habitat

Potential impacts on big game populations and crucial and severe habitat were identified as a cumulative effects issue by the agencies and during public scoping. The quality and quantity of available winter range is the foremost limiting factor for big game populations identified by state wildlife agencies in Wyoming, Colorado (CDOW 2006), and Utah (UDWR 2007a, b; 2008a, b, c; 2010a). Habitat quality is necessary for maintaining long term survival of big game species by providing adequate forage and cover.

Availability of crucial and severe winter range is essential for population survival during extreme or persistent climatic conditions, and is used during seasonal shortages in forage (Byers 2003; Peek 2003). Development that occurs in limited habitats or winter ranges places pressure on local wildlife populations, and impacts habitat quality and function (Sawyer et al. 2002); and surrounding habitat often cannot absorb or dissipate impacts from sensitive habitats (Watkins et al. 2007).

The cumulative effects analysis for big game species and their habitats addresses the potential effects of the Project and other past and present actions, and RFFAs and their contribution to loss, fragmentation, and modification of vegetation that provides crucial and severe elk, mule deer, pronghorn, moose and bighorn sheep habitats and forage; the degree to which these actions could place pressure on local wildlife populations and have additive effects on big game limiting factors (habitat quality, and availability of crucial and severe habitat); and the potential for these cumulative actions to affect local populations. Cumulative impacts on big game crucial and severe habitat were analyzed quantitatively, and effects are discussed qualitatively.

TABLE 4-64
CUMULATIVE IMPACTS ANALYSIS AREAS AND RATIONALE FOR WILDLIFE

Habitat Types¹	Cumulative Impacts Analysis Area²	Rationale	Type and Source of Spatial Data³
Big Game			
Elk Calving Ground Crucial Spring/Fall Crucial Summer/Summer Concentration Areas Crucial/Severe Winter Range Crucial Year-long Migration Corridors	Contiguous designated crucial and severe habitat in Hunt Units in Wyoming, Game Management Units in Colorado, and Herd Units in Utah crossed by alternative routes	Areas essential for the survival of individual elk and local elk populations that may be affected by the Project	Seasonal range boundaries and migration corridors (WGFD 2008, 2011d), production areas, severe winter range, summer concentration areas, and migration corridors (CPW 2012c) , and seasonal range boundaries (UDWR 2007a)
Mule Deer Crucial Summer/Summer Concentration Areas Crucial Spring/Fall Crucial/Critical Winter Range Crucial Winter/Spring Crucial Year-long Migration Corridors	Contiguous designated crucial and critical habitat in Hunt Units in Wyoming, Game Management Units in Colorado, and Herd Units in Utah, crossed by alternative routes	Areas essential for the survival of individual mule deer and local mule deer populations that may be affected by the Project	Seasonal range and migration corridors (WGFD 2008, 2010c), critical winter range and migration corridors (CPW 2012d), seasonal range boundaries (UDWR 2007b)
Pronghorn Fawning Areas Severe Winter Range Crucial Year-long Migration Corridors	Contiguous designated crucial and severe habitat in Hunt Units in Wyoming, Game Management Units in Colorado, and Herd Units in Utah, crossed by alternative routes	Areas essential for the survival of individual pronghorn and local pronghorn populations that may be affected by the Project	Seasonal range and migration corridors (WGFD 2008, 2010c), severe winter range, and migration corridors (CPW 2012e), summer and yearlong habitats (UDWR 2010a)
Moose Calving Areas Crucial Spring/Fall Crucial Winter Range Crucial Year-long	Contiguous designated crucial habitat in Hunt Units in Wyoming, and Herd Units in Utah, crossed by alternative routes	Areas essential for the survival of individual moose and local moose populations that may be affected by the Project	Seasonal range boundaries (UDWR 2006b; WGFD 2011c)

TABLE 4-64
CUMULATIVE IMPACTS ANALYSIS AREAS AND RATIONALE FOR WILDLIFE

Habitat Types¹	Cumulative Impacts Analysis Area²	Rationale	Type and Source of Spatial Data³
Rocky Mountain Bighorn Sheep Crucial Year-long	Contiguous designated crucial habitat in Hunt Units in Wyoming, and Herd Units in Utah, crossed by alternative routes	Areas essential for the survival of individual Rocky Mountain bighorn sheep and local Rocky Mountain bighorn sheep populations that may be affected by the Project	Seasonal range boundaries (UDWR 2006a; WGFD 2011a)
Desert Bighorn Sheep Crucial Year-long	Contiguous designated habitat in wildlife management units crossed by alternative routes	Areas essential for the survival of individual desert bighorn sheep and local desert bighorn sheep populations that may be affected by the Project	Seasonal range boundaries (UDWR 2008c)
Birds			
Migratory Birds	Vegetation communities in 12-digit hydrologic unit codes (HUC) (subwatersheds) crossed by alternative routes	Area beyond which effects of Project on migratory birds are no longer discernible	Gap Analysis Project (GAP) land cover categories from Northwest and Southwest Regional Gap Analysis Project (USGS 2010b, c)
Reptiles			
Reptiles	Vegetation communities in 12-digit HUCs (subwatersheds) crossed by alternative routes	Area beyond which effects of Project on migratory birds are no longer discernible	GAP land cover categories from Northwest and Southwest Regional Gap Analysis Project (USGS 2010b, c)
Mammals			
Mammals	Vegetation communities in 12-digit HUCs (subwatersheds) crossed by alternative routes	Area beyond which effects of Project on migratory birds are no longer discernible	GAP land cover categories from Northwest and Southwest Regional Gap Analysis Project (USGS 2010b, c)
NOTES: ¹Agency-designated big game habitats vary by state. Summer concentration, critical winter and severe winter are designated big game habitats in Colorado. Crucial summer, winter and year-long are designated habitats in Wyoming and Utah; crucial spring/fall and crucial winter/spring are designated habitat in Utah only. Mapped migration corridors are designated in Wyoming and Colorado only. ²Cumulative impacts analysis areas were established for wildlife designated and potential habitats based on the best available information regarding species specific home range or territory size. ³When data were provided as line files, migration corridors for elk, mule deer, and pronghorn were buffered by 0.25 mile on either side. Migration corridor data for elk, mule deer, and pronghorn were unavailable for the state of Utah.			

4.3.7.1.2 Cumulative Effects of Anthropogenic Development on Migratory Birds

The potential for the Project to affect migratory birds and their habitats was identified as an issue during public and agency scoping. Loss and fragmentation of migratory bird breeding and wintering habitat, and the cumulative effects of habitat change can adversely affect breeding success and lead to population declines in migratory bird species (Finch 1991; Robinson et al. 1995). The cumulative effects analysis for migratory birds addresses the potential for the Project and past and other present actions and RFFAs to contribute to loss, fragmentation, and modification of migratory bird breeding, nesting, foraging, wintering and stop-over habitats, as well as the potential for these actions to affect migratory bird behavior and existing patterns of seasonal distribution and habitat use. Effects on migratory birds are analyzed qualitatively. Detailed analysis of cumulative impacts on specific habitat types that are likely to be used by migratory birds are presented in Section 4.3.5. A list of priority migratory species and associated habitats that are likely to occur in the CIAA for all alternative routes is included in Appendix E (Table E-6).

4.3.7.1.3 Synergistic Temporal Effects with Other Actions

The potential for temporal and/or spatial synergistic, adverse effects on wildlife resulting from the construction of the Project and other transmission line projects (i.e., the TransWest Express and Gateway West transmission projects) were identified by the agencies and public during scoping. This analysis assumes that the selected route for the Project and the selected routes for the TransWest Express and the Gateway West (in Wyoming) transmission projects would be located in the same corridor and offset by approximately 1,500 feet. Construction of the Project may follow, and potentially overlap construction and stabilization efforts of the TransWest Express Transmission Project. Overlapping construction and stabilization periods for the two projects could result in temporal effects that could prolong displacement of wildlife from important habitats, displacement of wildlife from a larger geographic area, and extend the potential recovery time of wildlife from the direct and indirect effects from the Project. Cumulative effects of the Project and the TransWest Express and the Gateway West transmission projects are discussed qualitatively for each resource analyzed in detail.

4.3.7.1.4 Past, Present, and Other Reasonably Foreseeable Future Actions in the Wildlife Cumulative Impacts Analysis Area

Land administered by the Ashley, Manti-La Sal, and Uinta National Forests and the BLM in the Project area are managed for multiple-resource use. Past and present actions and RFFAs in the CIAA include timber harvest, livestock grazing, recreational use (e.g., off-road-vehicle use, biking, hiking, camping, and hunting), oil and gas exploration and development, mining, mineral production, constructions of transmission lines, pipelines, highways, wind- and solar-energy development, military training/testing, residential subdivision expansion, and communication site development. Past and present actions have contributed to incremental loss, alteration and fragmentation of foraging, nesting, breeding habitat and cover for wildlife species. Continuation of past and present actions into the future, in addition to other RFFAs is anticipated to contribute to the incremental modification of wildlife habitats in the CIAA. For a comprehensive summary of past and present actions and RFFAs refer to Tables 4-1 and 4-2.

4.3.7.2 Existing Condition

Conversion of native vegetation to agricultural use, deforestation and, crop cultivation in the CIAA began in the middle of the 19th century with European settlement and expansion and has significantly affected the character of landscapes and the quantity and quality of habitats for wildlife resources within the CIAA (Huston 2005). Construction of settlements, transportation systems, and increases in human population growth, the recreational industry (Leung and Marion 2000) and energy development also have resulted in further conversion of habitats for BLM decision and significant shifts in the abundance, distribution, and species composition of the fauna and flora of the area. These historic modifications to the landscape have

resulted in baseline conditions and trends to which the Project and other current, future and RFFAs (refer to Tables 4-1 and 4-2) analyzed in this section could contribute continuing and additive cumulative effects.

Energy and mineral development in the CIAA continue to place pressure on big game behavior, population dynamics, through the loss, modification and fragmentation of crucial habitat, and habitat quality and quantity remains a primary concern to wildlife managers (UDWR 2008d, 2009b, 2010b). Roads have increased the risk of ungulate mortality, and potential disturbance and stress to big game from increased recreational activity, human presence and noise; factors that can affect individual health, fitness and reproductive rates in big game (Bowles 1995; Leung and Marion 2000). Sensitivity to, and/or toleration of anthropogenic disturbance in the CIAA however, is likely to be species-specific and a function of population or individual response to disturbance. Domestic livestock grazing in the CIAA has increased competition for forage between livestock and big game species, particularly in crucial winter ranges or summer ranges where habitat and forage is limited or affected by drought (UDWR 2008d, 2009b, 2010b). Livestock grazing also has altered native plant communities and increased exotic grass and invasive plant encroachment, which has had an additive effect on habitat loss and degradation in the CIAA. Furthermore, fences may alter movement patterns between seasonal ranges, restrict access to water and feeding areas and disrupt migration patterns in the CIAA; particularly for pronghorn and mule deer (UDWR 2008d, 2009b). Despite these incremental modifications of natural landscapes, however, wildlife habitat functionality is maintained and oftentimes enhanced on USFS- and BLM-administered lands and private lands in the Project area through habitat restoration and improvement projects that promote ecosystem health (BLM 2013p), management of invasive species (USFS 2004b), and government incentive programs such as the Wildlife Habitat Incentives Program (NRCS 2013).

4.3.7.3 Results

4.3.7.3.1 Cumulative Impacts on Wildlife Resources Common to all Alternative routes

The alternative routes cross similar ecosystems that support wildlife resources and the types of past, present, and RFFAs in the CIAA for all alternative routes are also similar. Due to the similarity of resources affected and past, present, and future actions in the CIAA, many cumulative effects on wildlife resources would be common to all alternative routes. Data that could be used to complete a quantitative analysis of the cumulative effects on the Project and other past, present, and RFFAs are not available for most bird, reptile and mammal species. Therefore, the potential effects on these resources are analyzed qualitatively.

Migratory Birds

Information that supports the analysis of potential cumulative effects on migratory birds includes quantitative analysis of cumulative impacts on habitat types that are likely to be used by migratory birds included in Section 4.3.5 and lists of priority migratory birds (such as song birds, waterfowl, and raptors) and associated habitats that are likely to occur in the CIAA included in Appendix E, Table E-6.

Population trends of migratory birds are available from Breeding Bird Surveys (Sauer et al. 2012). Surveys conducted at the regional scale between 2000 and 2010 in the Breeding Bird Surveys for the western region showed that 26 percent of short-distance and neotropical migratory species surveyed showed significant declines; but 40 percent of migratory species surveyed showed significant population increases (total species count 178). Breeding Bird Surveys conducted at the state level between 2000 and 2010 showed 3 percent of short-distance and neotropical migrant species surveyed in Wyoming had significant population declines, and 12 percent showed significant population increases (total 111 species). In Colorado, 19 percent showed significant population declines and 20 percent showed

significant population increases (total 120 species); and in Utah, 27 percent showed significant population declines and 35 percent showed significant population increases (total 104 species) (Sauer et al. 2012).

Population trends at the habitat level are considered in relation to particular habitat type, and include species other than migratory species. Many wetland bird populations are increasing due to concerted conservation efforts of those habitats; however, populations associated with grassland, arid land, and forested habitats are in decline (North American Bird Conservation Initiative 2009). Many passerine populations associated with Intermountain shrub steppe and grasslands are in decline (Gilbert and Chalfoun 2011; Knick and Rotenberry 2002). In the Intermountain west, 37 shrub-steppe dependent species showed population declines, compared to a population increase in only three species (Dobkin and Sauder 2004).

Conservation of migratory birds in the Intermountain West has focused on preservation and restoration of habitat. Threats to migratory species include the loss, alteration and degradation of habitat resulting from ongoing land use change and development, invasive plant introduction, changes in fire intensity and frequency resulting from land management practices and livestock grazing, alterations of stream flows and spring development, and increases in recreation (Rich et al. 2004). Migratory bird sensitivity to, and recovery from disturbance is likely to be a function of species-specific characteristics and behavior, as well as the type of action (scale, density and arrangement) of each development in relation to other development and occupied habitat. Developments with structures (such as communication towers, wind turbines, commercial and residential buildings and transmission lines); or disturbance that occurs over multiple breeding seasons in or in proximity to important nesting, breeding, foraging, and stop-over habitats, migratory paths and concentration areas could increase site avoidance, behavioral disturbance and mortality at the population level (Manville 2009).

All alternative routes and route variations would contribute to the cumulative loss, fragmentation, and modification of bird and migratory bird habitat resulting from past and present actions and RFFAs in the CIAA. Past and present actions in the CIAA include coal mines, communication facilities, historical fire boundaries, pipelines, mineral leases, oil and gas development, oil shale development, recreational and residential development, wind energy facilities, habitat and rangeland management activities, and vegetation management activities. RFFAs in the CIAA include coal mines, industrial development, oil and gas development, pipelines, power generation facilities, recreational and residential development, habitat restoration projects; and the TransWest Express, Mona South, Mona North, and Gateway West transmission lines. A detailed description of past and present actions and RFFAs associated with specific habitat types likely to be used by migratory bird species is included in Section 4.3.5.

Disturbance from construction and reclamation of any of the alternative routes could overlap temporally with the construction and reclamation activities of the TransWest Express Transmission Project, and could result in synergistic temporal effects that prolong disturbance (approximately 5 years), and migratory bird avoidance of suitable habitat over multiple breeding seasons in proximity to the two transmission lines. Synergistic effects from colocating the Project with the TransWest Express and/or the Gateway West (in Wyoming) transmission projects could increase potential collision risk for migratory birds, particularly in areas where transmission lines cross bird landing or take-off flight paths (Janss 2000), such as the Platte River in Wyoming. Physiological factors that increase the risk of collision with transmission line wires are described in Section 3.2.7. However, there also are technical considerations for the location of multiple transmission lines across the landscape (APLIC 2012). Colocating the Project and TransWest Express and/or Gateway West transmission projects within a distance of 1,500 feet may require birds to make repeated flight adjustments and could increase collision risk compared to a single transmission line. Collision risk could be reduced in sensitive areas, such as known migratory or flight paths, by siting the transmission lines directly adjacent to one another (within 250 feet), which would increase the visibility of the wires, limit the area of disturbance, and require birds to make only one flight

adjustment to circumvent wires (APLIC 2012; Bevanger 1994). Potential collisions with wires located at different heights are unlikely to occur as similar clearance standards would be required for colocated transmission lines, which carry similar voltage.

Overall, each action in the CIAA could contribute incrementally to localized loss, modification, and fragmentation of migratory bird habitat and changes in migratory bird behavior, seasonal distribution and abundance. Cumulative disturbance from all actions considered would contribute to historic and ongoing loss and modification of habitat supporting migratory bird populations at the regional scale, and based on anticipated RFFAs, regional trends, including declines in shrub steppe and grassland migratory bird populations are likely to continue. However, most migratory bird habitat would remain undisturbed by the Project and other actions in the CIAA (refer to Section 4.3.5) and range wide migratory bird populations and current distributions appear secure.

Reptiles

All alternative routes and route variations would contribute to the cumulative loss, fragmentation, and modification of reptile habitats resulting from past and present actions and RFFAs in the CIAA (refer to the Migratory Birds Section for a detailed list of past and present actions, and RFFAs in the CIAA for all alternative routes considered for the Project).

Population declines in many reptile species have been attributed to habitat loss and degradation, invasive species introduction, environmental pollutants (such as pesticides and herbicides), and physiological factors (Gibbons et al. 2000). Cumulative effects on reptiles and their habitat from action in the CIAA would include the loss, alteration and fragmentation to foraging and breeding habitat, and cover, which would reduce habitat quality and function and could affect reptile abundance and distribution, and mortality rates (Newbold 2005; Stebbins 2003; Vitt and Pianka 1994; Yahner et al. 2001). Reptile sensitivity to, and recovery from cumulative disturbance in the CIAA is likely to be a function of species-specific characteristics and behavior; and the type of action (scale, density and arrangement) of each development in relation to occupied habitat. High-density developments (such as oil and gas fields), which clear vegetation, affect microclimate and increase soil compaction could have greater cumulative impacts on reptiles than low density development (such as dispersed recreation projects). Alternatively, gas-well disturbance may be used by reptiles seasonally for basking and egg-laying (Moseley et al. 2010). Impacts on reptiles from road construction that result in reptile avoidance or changes in movement may depend on road characteristics (such as width and road surface); and the degree of visual disturbance, noise and vibration of activity on the road (Brehme et al. 2012).

The Project could overlap spatially with the TransWest Express and/or the Gateway West (in Wyoming) transmission projects and could result in cumulative effects on reptiles in the Project area. Additionally, construction and reclamation activities of the Project could temporally overlap with the construction and reclamation activities of the TransWest Express Transmission Project, which could result in synergistic effects that prolong disturbance on reptile species. Research suggests that revegetation efforts and early successional foliage could increase habitat for reptiles on rights-of-way and result in a greater abundance of reptile species than in the adjacent border zones (Yahner 2004; Yahner et al. 2001). However, reptile response to vegetation treatments likely would be a function of the quality, availability and type of surrounding habitat. Overall, the Project would contribute to past and future modification of potentially suitable reptile habitat, and the cumulative disturbance from all actions considered could place additional stress on habitats that are currently limiting for reptile populations in the CIAA. However, the effects of the Project would be anticipated to be small compared to the effects of other actions, as the majority of ground disturbance in the CIAA would result from other actions. Under all alternative routes and route variations, the majority of potentially suitable reptile habitat would remain undisturbed by the Project and other actions in the CIAA. Quantitative analysis of cumulative impacts on habitat types that are likely to be used by reptiles is included in Section 4.3.5.

Mammals

All alternative routes and route variations would contribute to the cumulative loss, fragmentation, and modification of mammal habitats resulting from past and present actions and RFFAs in the CIAA (refer to the Birds Section for a detailed list of past and present actions and RFFAs in the CIAA for all alternative routes).

Recent small mammal surveys in the Intermountain West region suggest a lack of mammal occurrence in suitable shrub-steppe habitats (Dobkin and Sauder 2004). Of 22 species surveyed only one species appeared relatively common. Where small terrestrial mammals did occur, they were found in small, disconnected populations; isolated by unsuitable habitat that restricted movement. Cumulative effects on mammals and potentially suitable habitat as a result of Project impacts and other past, present, and future actions include loss, alteration and fragmentation to foraging and breeding habitat, and cover, which could affect mammal abundance, distribution, dispersal and survival (Hanser et al. 2011; Noss et al. 2006) in the CIAA. Mammal sensitivity to, and recovery from cumulative disturbance in the CIAA is likely to be a function of species-specific characteristics and behavior; and the type of action (scale, density and arrangement) of each development in relation to occupied habitat. High-density developments (such as oil and gas fields) that affect microclimate and increase, noise and soil compaction; or development that increase habitat fragmentation (such as roads) through vegetation clearance could have greater cumulative impacts on mammals than low-density or nonfragmenting development (such as dispersed recreation projects). Continuous and intermittent noise from anthropogenic development can have considerable effects on foraging and reproductive success, anti-predator and territorial behavior, and community structure in a diverse number of terrestrial species (Barber et al. 2009). Soil compaction associated with gas wells, for example, may suppress establishment of suitable vegetation cover, increase predation risk and affect mammal abundance (Moseley et al. 2010). Impacts on small mammals from road construction can result in avoidance or changes in movement due to road characteristics such as road width and surface (Brehme et al. 2012). Dirt roads and secondary paved roads may be more permeable to some small mammalian species than wider paved roads (Brehme et al. 2012). Mammals isolated in small patches of fragmented habitat are at increased risk of local extinction because recolonization, movement and gene flow necessary for long-term persistence are restricted (Moseley et al. 2010).

Overall, the Project would contribute to past and future modification of potentially suitable habitat for mammals, and the cumulative disturbance from all actions considered could contribute to factors currently limiting mammal populations in the CIAA. The Project could overlap spatially with the TransWest Express and/or the Gateway West (in Wyoming) transmission projects and could result in cumulative effects on mammals in the Project area. Additionally, construction and reclamation activities of the Project could temporally overlap with the construction and reclamation activities of the TransWest Express Transmission Project, resulting in cumulative effects that prolong disturbance on mammal species. However, the effects of the Project would be anticipated to be small compared to the effects of other actions. Under all alternative routes and route variations, the majority of potentially suitable mammal habitat would remain undisturbed by the Project and other actions in the CIAA. Quantitative analysis of cumulative impacts on habitat types that are likely to be used by mammals is included in Section 4.3.5.

4.3.7.3.2 Quantitative Cumulative Impacts on Wildlife Resources

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Elk

The estimated area (in acres) of cumulative development in elk crucial/severe habitat and migration corridors is summarized in Table 4-65.

TABLE 4-65 ELK CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Calving Grounds						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	263,477	18,600	1,003	155	19,758	243,720
WYCO-B-1	263,477	18,600	1,003	154	19,757	243,721
WYCO-B-2 (Agency Preferred Alternative)	263,477	18,600	1,003	154	19,757	243,721
WYCO-B-3	263,477	18,600	1,003	155	19,757	243,720
Alternative WYCO-C and Route Variations						
WYCO-C	263,477	18,600	1,003	154	19,756	243,721
WYCO-C-1	263,477	18,600	1,003	153	19,756	243,722
WYCO-C-2	263,477	18,600	1,003	153	19,756	243,722
WYCO-C-3	263,477	18,600	1,003	153	19,756	243,721
Alternative WYCO-D and Route Variation						
WYCO-D	310,104	22,384	8,369	0	30,752	279,351
WYCO-D-1	310,104	22,384	8,369	0	30,752	279,351
Alternative WYCO-F and Route Variations						
WYCO-F	263,477	18,600	1,003	153	19,756	243,722
WYCO-F-1	263,477	18,600	1,003	152	19,755	243,722
WYCO-F-2	263,477	18,600	1,003	152	19,755	243,722
WYCO-F-3	263,477	18,600	1,003	153	19,756	243,722
Crucial Summer/Summer Concentration						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	272,236	11,297	1,104	155	12,555	259,681
WYCO-B-1	272,236	11,297	1,104	154	12,554	259,681
WYCO-B-2 (Agency Preferred Alternative)	272,236	11,297	1,104	154	12,555	259,681
WYCO-B-3	272,236	11,297	1,104	155	12,555	259,681
Alternative WYCO-C and Route Variations						
WYCO-C	272,236	11,297	1,104	154	12,554	259,682
WYCO-C-1	272,236	11,297	1,104	153	12,553	259,682
WYCO-C-2	272,236	11,297	1,104	153	12,553	259,682
WYCO-C-3	272,236	11,297	1,104	153	12,554	259,682

TABLE 4-65 ELK CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-D and Route Variation						
WYCO-D	355,187	23,145	5,352	0	28,497	326,690
WYCO-D-1	355,187	23,145	5,352	0	28,497	326,690
Alternative WYCO-F and Route Variations						
WYCO-F	272,236	11,297	1,104	153	12,553	259,682
WYCO-F-1	272,236	11,297	1,104	152	12,553	259,683
WYCO-F-2	272,236	11,297	1,104	152	12,553	259,683
WYCO-F-3	272,236	11,297	1,104	153	12,553	259,682
Crucial/Severe Winter Range						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	461,730	33,614	2,495	594	36,702	425,027
WYCO-B-1	461,730	33,614	2,495	591	36,700	425,030
WYCO-B-2 (Agency Preferred Alternative)	461,730	33,614	2,495	592	36,700	425,029
WYCO-B-3	461,730	33,614	2,495	593	36,702	425,028
Alternative WYCO-C and Route Variations						
WYCO-C	461,730	33,614	2,495	590	36,698	425,031
WYCO-C-1	461,730	33,614	2,495	587	36,696	425,034
WYCO-C-2	461,730	33,614	2,495	588	36,696	425,033
WYCO-C-3	461,730	33,614	2,495	589	36,698	425,032
Alternative WYCO-D and Route Variation						
WYCO-D	1,080,286	118,357	4,401	1,121	123,878	956,408
WYCO-D-1	1,080,286	118,357	4,401	1,123	123,880	956,405
Alternative WYCO-F and Route Variations						
WYCO-F	461,730	33,614	2,495	587	36,696	425,034
WYCO-F-1	461,730	33,614	2,495	585	36,693	425,036
WYCO-F-2	461,730	33,614	2,495	585	36,694	425,036
WYCO-F-3	461,730	33,614	2,495	587	36,695	425,034
Crucial Year-long						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	382,754	72,890	86	28	73,003	309,751
WYCO-B-1	382,754	72,890	86	28	73,003	309,751
WYCO-B-2 (Agency Preferred Alternative)	382,754	72,890	86	28	73,003	309,751
WYCO-B-3	382,754	72,890	86	28	73,003	309,751

TABLE 4-65 ELK CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-C and Route Variations						
WYCO-C	382,754	72,890	86	28	73,003	309,751
WYCO-C-1	382,754	72,890	86	27	73,003	309,751
WYCO-C-2	382,754	72,890	86	27	73,003	309,751
WYCO-C-3	382,754	72,890	86	28	73,003	309,751
Alternative WYCO-D and Route Variation						
WYCO-D	382,896	72,930	86	0	73,016	309,880
WYCO-D-1	382,896	72,930	86	0	73,016	309,880
Alternative WYCO-F and Route Variations						
WYCO-F	382,754	72,890	86	27	73,003	309,751
WYCO-F-1	382,754	72,890	86	27	73,003	309,751
WYCO-F-2	382,754	72,890	86	27	73,003	309,751
WYCO-F-3	382,754	72,890	86	27	73,003	309,751
Migration Corridors						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	398,049	32,802	321	54	33,178	364,872
WYCO-B-1	398,049	32,802	321	54	33,177	364,872
WYCO-B-2 (Agency Preferred Alternative)	398,049	32,802	321	54	33,178	364,872
WYCO-B-3	398,049	32,802	321	54	33,178	364,872
Alternative WYCO-C and Route Variations						
WYCO-C	398,049	32,802	321	54	33,177	364,872
WYCO-C-1	398,049	32,802	321	54	33,177	364,872
WYCO-C-2	398,049	32,802	321	54	33,177	364,872
WYCO-C-3	398,049	32,802	321	54	33,177	364,872
Alternative WYCO-D and Route Variation						
WYCO-D	622,129	56,782	2,549	281	59,611	562,518
WYCO-D-1	622,129	56,782	2,549	281	59,612	562,517
Alternative WYCO-F and Route Variations						
WYCO-F	398,049	32,802	321	54	33,177	364,872
WYCO-F-1	398,049	32,802	321	54	33,177	364,873
WYCO-F-2	398,049	32,802	321	54	33,177	364,873
WYCO-F-3	398,049	32,802	321	54	33,177	364,872
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated elk crucial and severe range, and migration routes from any of the WYCO alternative routes and route variations would contribute to the cumulative loss, fragmentation, and degradation of elk crucial and severe habitat in the CIAA (Table 4-65). Past and present actions in the CIAA for all WYCO alternative routes that have affected designated elk crucial/severe habitat and migration corridors include historical fires, oil and gas development, coal

mines, wind-energy development, and vegetation management. RFFAs in the CIAA for elk calving grounds, crucial/severe winter and crucial year-long habitat include a coal mine and the TransWest Express Transmission Project. RFFAs in the CIAA for elk migration routes include the Gateway West transmission line and a wind-energy facility.

The majority of elk crucial and severe range affected by the Project is located in Colorado. Elk herds affected by the Project in Colorado include the E-2 (Bears Ears) and E-6 (White River) herds, which are currently over carrying capacity due to increased population numbers and ongoing loss, fragmentation and alteration of crucial habitat (CDOW 2005b). The availability of crucial winter range in the CIAA is a limiting factor for elk populations, and would be affected more by Alternative WYCO-D and WYCO-D-1 compared to other WYCO alternative routes. Elk crucial/severe range and migration corridors affected by the WYCO alternative routes and route variations are located in areas previously disturbed by past and present human activities, suggesting that local elk populations have some level of tolerance towards human activity and habitat disturbance. Research suggests that some elk compensate for site-specific environmental disturbance from energy development such as oil and gas development by shifting range use, centers of activity and habitat use rather than abandoning range completely (Van Dyke and Klein 1996). Further research showed that elk use of sites cleared for oil and gas development was not immediate, but correlated with an increase in grass and forb abundance over a 2 year period post-construction (Van Dyke et al. 2012). Elk also were found to shift range use during construction of a wind-energy facility when human presence increased, but subsequently acclimated to the development and crossed access roads in their range; elk range shifts did not affect their nutrition and dietary quality despite loss of resources due to development (Walter et al. 2006).

The WYCO alternative routes could overlap spatially with the TransWest Express and the Gateway West (in Wyoming) transmission projects. Additionally, disturbance from construction and reclamation activities of the Project could temporally overlap with the construction and reclamation activities of the TransWest Express Transmission Project, which could result in synergistic temporal effects that could prolong elk avoidance of crucial habitat in proximity to the two transmission lines. Impacts on elk populations would be minimized or avoided through implementation of seasonal restrictions for both projects. Overall, the Project would contribute to past and future modification of elk crucial habitat, and the cumulative disturbance from all actions considered could add to carrying capacity pressure of local herds by limiting availability of crucial habitat in the CIAA. However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-65). Under all WYCO alternative routes, the majority of available elk crucial/severe habitat and migration corridors would remain undisturbed by the Project and other actions in the CIAA (Table 4-65).

Mule Deer

The estimated area (in acres) of cumulative development in mule deer critical/severe habitat and migration corridors is summarized in Table 4-66.

TABLE 4-66 MULE DEER CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Crucial/Critical Winter Range						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	585,709	52,647	2,819	346	55,812	529,897
WYCO-B-1	585,709	52,647	2,819	345	55,812	529,897
WYCO-B-2 (Agency Preferred Alternative)	585,709	52,647	2,819	366	55,832	529,877
WYCO-B-3	585,709	52,647	2,819	345	55,812	529,897
Alternative WYCO-C and Route Variations						
WYCO-C	585,709	52,647	2,819	343	55,810	529,899
WYCO-C-1	585,709	52,647	2,819	343	55,810	529,899
WYCO-C-2	585,709	52,647	2,819	363	55,830	529,879
WYCO-C-3	585,709	52,647	2,819	343	55,810	529,899
Alternative WYCO-D and Route Variation						
WYCO-D	877,772	94,255	3,228	372	97,855	779,917
WYCO-D-1	877,772	94,255	3,228	373	97,856	779,916
Alternative WYCO-F and Route Variations						
WYCO-F	585,709	52,647	2,819	342	55,808	529,901
WYCO-F-1	585,709	52,647	2,819	342	55,808	529,901
WYCO-F-2	585,709	52,647	2,819	362	55,828	529,881
WYCO-F-3	585,709	52,647	2,819	342	55,808	529,901
Crucial Year-long						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	898,860	102,833	5,519	327	108,680	790,181
WYCO-B-1	898,860	102,833	5,519	327	108,679	790,181
WYCO-B-2 (Agency Preferred Alternative)	898,860	102,833	5,519	327	108,679	790,181
WYCO-B-3	898,860	102,833	5,519	328	108,680	790,180
Alternative WYCO-C and Route Variations						
WYCO-C	898,860	102,833	5,519	326	108,678	790,182
WYCO-C-1	898,860	102,833	5,519	604	108,956	789,904
WYCO-C-2	898,860	102,833	5,519	604	108,957	789,904
WYCO-C-3	898,860	102,833	5,519	428	108,781	790,080
Alternative WYCO-D and Route Variation						
WYCO-D	898,837	102,833	5,519	423	108,775	790,062
WYCO-D-1	898,837	102,833	5,519	423	108,776	790,062

TABLE 4-66 MULE DEER CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-F and Route Variations						
WYCO-F	898,860	102,833	5,519	427	108,779	790,081
WYCO-F-1	898,860	102,833	5,519	0	108,352	790,508
WYCO-F-2	898,860	102,833	5,519	0	108,352	790,508
WYCO-F-3	898,860	102,833	5,519	0	108,352	790,508
Migration Corridors						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	236,744	30,224	2,343	56	32,624	204,121
WYCO-B-1	236,744	30,224	2,343	56	32,623	204,121
WYCO-B-2 (Agency Preferred Alternative)	236,744	30,224	2,343	56	32,623	204,121
WYCO-B-3	236,744	30,224	2,343	56	32,623	204,121
Alternative WYCO-C and Route Variations						
WYCO-C	236,744	30,224	2,343	54	32,621	204,123
WYCO-C-1	236,744	30,224	2,343	53	32,621	204,123
WYCO-C-2	236,744	30,224	2,343	53	32,621	204,123
WYCO-C-3	236,744	30,224	2,343	54	32,621	204,123
Alternative WYCO-D and Route Variation						
WYCO-D	248,169	32,505	2,351	126	34,982	213,188
WYCO-D-1	248,169	32,505	2,351	126	34,982	213,187
Alternative WYCO-F and Route Variations						
WYCO-F	236,744	30,224	2,343	175	32,742	204,002
WYCO-F-1	236,744	30,224	2,343	174	32,742	204,003
WYCO-F-2	236,744	30,224	2,343	174	32,742	204,002
WYCO-F-3	236,744	30,224	2,343	175	32,742	204,002
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated mule deer critical/severe range, and migration routes from any of the WYCO alternative routes and route variations would contribute to the cumulative loss, fragmentation, and degradation of mule deer critical/severe range in the CIAA (Table 4-66). Past and present actions in the CIAA for all WYCO alternative routes that have affected designated mule deer critical/severe habitat and migration corridors include historical fires, oil and gas development, coal mines, industrial development, wind-energy development, habitat and rangeland management, and vegetation management. RFFAs in the CIAA for all WYCO alternative routes include oil and gas development, coal mines, wind energy development, and the Gateway West and TransWest Express transmission lines. Potential impacts on mule deer populations in the CIAA from past and present actions and RFFAs could be a function of the type of action, and scale, density and arrangement of each development in designated critical/severe habitat (Lutz et al. 2011). Large-scale or high-density actions that disrupt mule deer over multiple breeding seasons (e.g., high density oil and gas development and

infrastructure) would have greater impacts than low-density development. Similarly, actions such as habitat and vegetation management could have beneficial effects on mule deer.

In Wyoming, mule deer herds affected by the Project include the Platte River (MD541) and Baggs (MD247) herds (WGFD 2012a). Ongoing loss, fragmentation and alteration of habitat from energy development, and the availability of critical/severe winter range and production areas are limiting factors for mule deer in the CIAA. Mule deer critical/severe winter range affected by any of the WYCO alternative routes is located in areas previously disturbed by past and present human activities; suggesting that local mule deer populations tolerate some level of human activity and habitat disturbance. The Project could overlap spatially with the TransWest Express and/or the Gateway West (in Wyoming) transmission projects and could result in synergistic effects on mule deer in the Project area. Additionally, synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong mule deer displacement from critical/severe habitat and increase physiological stress in populations in proximity to the colocated Projects, although impacts on mule deer would be subject to seasonal selective mitigation measures. Overall, the Project would contribute to past and future modifications of mule deer critical/severe range, and the cumulative disturbance from all actions considered could contribute to ongoing loss, fragmentation and alteration of critical/severe range that limit local mule deer populations in the CIAA. However, the effects of the Project would be anticipated to be small compared to the effects of other actions (Table 4-66). Under all WYCO alternative routes and route variations, the majority of available mule deer critical/severe habitat and migration corridors in Wyoming and Colorado would remain undisturbed by the Project and other actions in the CIAA (Table 4-66).

Pronghorn

The estimated area (in acres) of cumulative development in pronghorn crucial/severe habitat and migration corridors is summarized in Table 4-67.

TABLE 4-67 PRONGHORN CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Crucial/Severe Winter Range						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	228,064	15,352	1,328	201	16,881	211,184
WYCO-B-1	228,064	15,352	1,328	242	16,921	211,143
WYCO-B-2 (Agency Preferred Alternative)	228,064	15,352	1,328	200	16,880	211,185
WYCO-B-3	228,064	15,352	1,328	201	16,881	211,184
Alternative WYCO-C and Route Variations						
WYCO-C	228,064	15,352	1,328	199	16,879	211,185
WYCO-C-1	228,064	15,352	1,328	240	16,920	211,144
WYCO-C-2	228,064	15,352	1,328	198	16,878	211,186
WYCO-C-3	228,064	15,352	1,328	199	16,879	211,185

TABLE 4-67 PRONGHORN CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-D and Route Variation						
WYCO-D	258,271	23,629	1,811	289	25,729	232,542
WYCO-D-1	258,271	23,629	1,811	289	25,730	232,542
Alternative WYCO-F and Route Variations						
WYCO-F	228,064	15,352	1,328	199	16,878	211,186
WYCO-F-1	228,064	15,352	1,328	239	16,919	211,145
WYCO-F-2	228,064	15,352	1,328	198	16,877	211,187
WYCO-F-3	228,064	15,352	1,328	199	16,878	211,186
Crucial Year-long						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	1,108,918	83,939	10,538	442	94,919	1,013,999
WYCO-B-1	1,108,918	83,939	10,538	440	94,917	1,014,001
WYCO-B-2 (Agency Preferred Alternative)	1,108,918	83,939	10,538	440	94,917	1,014,001
WYCO-B-3	1,108,918	83,939	10,538	441	94,919	1,013,999
Alternative WYCO-C and Route Variations						
WYCO-C	1,108,918	83,939	10,538	418	94,895	1,014,023
WYCO-C-1	1,108,918	83,939	10,538	416	94,893	1,014,025
WYCO-C-2	1,108,918	83,939	10,538	416	94,893	1,014,025
WYCO-C-3	1,108,918	83,939	10,538	417	94,894	1,014,024
Alternative WYCO-D and Route Variation						
WYCO-D	1,109,063	84,110	10,538	563	95,212	1,013,851
WYCO-D-1	1,109,063	84,110	10,538	564	95,213	1,013,850
Alternative WYCO-F and Route Variations						
WYCO-F	1,108,918	83,939	10,538	523	95,000	1,013,918
WYCO-F-1	1,108,918	83,939	10,538	521	94,998	1,013,920
WYCO-F-2	1,108,918	83,939	10,538	522	94,999	1,013,919
WYCO-F-3	1,108,918	83,939	10,538	523	95,000	1,013,918
Migration Corridors						
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	225,390	22,875	2,902	134	25,911	199,479
WYCO-B-1	225,390	22,875	2,902	133	25,911	199,479
WYCO-B-2 (Agency Preferred Alternative)	225,390	22,875	2,902	133	25,911	199,479
WYCO-B-3	225,390	22,875	2,902	134	25,911	199,479

TABLE 4-67 PRONGHORN CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-C and Route Variations						
WYCO-C	225,390	22,875	2,902	97	25,874	199,515
WYCO-C-1	225,390	22,875	2,902	97	25,874	199,516
WYCO-C-2	225,390	22,875	2,902	97	25,874	199,516
WYCO-C-3	225,390	22,875	2,902	97	25,874	199,516
Alternative WYCO-D and Route Variation						
WYCO-D	225,064	22,868	2,900	70	25,838	199,226
WYCO-D-1	225,064	22,868	2,900	70	25,838	199,226
Alternative WYCO-F and Route Variations						
WYCO-F	225,390	22,875	2,902	159	25,936	199,454
WYCO-F-1	225,390	22,875	2,902	158	25,935	199,455
WYCO-F-2	225,390	22,875	2,902	158	25,935	199,454
WYCO-F-3	225,390	22,875	2,902	159	25,936	199,454
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated pronghorn crucial/severe range, and migration routes from any of the WYCO alternative routes and route variations would contribute to the cumulative loss, fragmentation, and degradation of pronghorn crucial/severe range in the CIAA (Table 4-67). Past and present actions in the CIAA for all WYCO alternative routes that have affected designated pronghorn crucial/severe habitat and migration corridors include historical fires, oil and gas development, coal mines, residential development, wind-energy development, and vegetation management. RFFAs in the CIAA for all WYCO alternative routes include oil and gas development, coal mines, wind energy development, and the Gateway West and TransWest Express transmission lines. Potential impacts on pronghorn populations in the CIAA from past and present actions and RFFAs could be a function of the location and type of development in relation to the location of pronghorn designated crucial/severe habitat and migration corridors. Development that severs migration corridors, particularly via roads or fences, could affect distribution of pronghorn on winter ranges (Sawyer et al. 2002). Large-scale or high density actions that disrupt pronghorn over multiple breeding seasons (e.g., high density oil and gas development and infrastructure) would have greater impacts than low-density development. Habitat and vegetation management could have beneficial effects on pronghorn.

In Wyoming, pronghorn herds that could be affected by the WYCO alternative routes include Iron Springs herd (PR630) with a population estimated at approximately 10,000; Baggs herd (PR438) with an estimated population of 8,100; and Bitter Creek herd (PR414) with an average population of 7,531 (WGFD 2012a). Ongoing loss, fragmentation and alteration of habitat from energy development, and the availability of crucial/severe winter range and fawning areas are limiting factors for pronghorn in the CIAA. Pronghorn crucial/severe range affected by any of the WYCO alternative routes is located in areas previously disturbed by past and present human activities; suggesting that local pronghorn populations tolerate some level of human activity and habitat disturbance. However, individual response of pronghorn to energy development can vary from tolerance to strong avoidance (Berger et al. 2007).

Disturbance from construction and stabilization of any of the WYCO alternative routes could overlap temporally with the construction and stabilization activities of the TransWest Express and/or the Gateway West (in Wyoming) transmission line projects, and could result in synergistic temporal effects that

prolong pronghorn displacement from critical/severe habitat in proximity to the colocated transmission lines. Impacts on pronghorn from both transmission line projects would be minimized or avoided through implementation of seasonal restrictions. Overall, the Project would contribute to past and future modification of pronghorn crucial/severe range, and the cumulative disturbance from all actions considered could contribute to ongoing loss, fragmentation and alteration of habitat, and the availability of crucial/severe winter range and fawning areas that limit local pronghorn herds in the CIAA. However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-67). Under all WYCO alternative routes and route variations, the majority of available pronghorn crucial/severe habitat and migration corridors in Wyoming and Colorado would remain undisturbed by the Project and other actions in the CIAA (Table 4-67).

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Elk

The estimated area (in acres) of cumulative development in elk crucial/severe habitat and migration corridors is summarized in Table 4-68.

TABLE 4-68 ELK CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Calving Grounds						
COUT BAX-B	275,394	11,553	251	75	11,879	263,515
COUT BAX-C	275,394	11,553	251	74	11,877	263,517
COUT BAX-E	275,394	11,553	251	72	11,875	263,519
Crucial Summer/Summer Concentration						
COUT BAX-B	849,861	120,445	9,344	294	130,083	719,778
COUT BAX-C	1,010,484	136,491	9,489	288	146,269	864,215
COUT BAX-E	1,010,484	136,491	9,489	207	146,187	864,297
Crucial/Severe Winter Range						
COUT BAX-B	894,696	157,615	7,603	371	165,590	729,106
COUT BAX-C	1,041,050	161,112	7,987	365	169,464	871,586
COUT BAX-E	1,041,050	161,112	7,987	382	169,481	871,569
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated elk crucial and severe range from any of the COUT BAX alternative routes would contribute to the cumulative loss, fragmentation, and degradation of elk crucial and severe habitat in the CIAA (Table 4-68). Past and present actions in the CIAA for all COUT BAX alternative routes that have affected designated elk crucial/severe habitat include historical fires, oil and gas development, oil shale and tar sands development, gravel pits, oil shale development, pipelines, coal mines, mineral development, residential development, communication facilities, and habitat/rangeland and vegetation management. RFFAs in the CIAA include coal mines, recreational development, a tunnel, transportation infrastructure, sand and gravel mining, construction of a reservoir, a dam, pipelines, and the TransWest Express Transmission Project.

Elk herds that could be affected by the COUT BAX alternative routes include the Yellow Creek (DAU E-10) herd in Colorado (CDOW 2006) and the Central Mountains elk herd in Utah (UDWR 2012a).

Limiting factors for elk in the CIAA include the availability of crucial winter range, and an exponential increase in oil and gas development (CDOW 2006). However, elk crucial/severe range affected by COUT BAX alternative routes are located in areas previously disturbed by past and present human activities, suggesting that local elk populations have some level of tolerance towards human activity and habitat disturbance. Furthermore, the E-10 herd has an increasing population of approximately 8,700 animals (CDOW 2006), and the Central Mountains elk herd consists of approximately 12,600 animals, which is higher than management objectives (UDWR 2012a). Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express transmission lines could prolong elk displacement from crucial/severe habitat in proximity to the two projects; although impacts on elk would be subject to seasonal selective mitigation measures (refer to elk discussion for the WYCO alternative routes). Overall, the Project would contribute to past and future modification of elk crucial habitat, and the cumulative disturbance from all actions considered could further limit availability of crucial/severe range in the CIAA necessary for maintaining local elk herd populations that are currently close to or exceeding the carrying capacity of current resources (CDOW 2006; UDWR 2012a). However, the effects of the Project would be anticipated to be small compared to the effects of other actions (Table 4-68). Under all COUT BAX alternative routes, the majority of available elk crucial/severe range and calving grounds would remain undisturbed by the Project and other actions in the CIAA (Table 4-68).

Mule Deer

The estimated area (in acres) of cumulative development in mule deer critical/severe habitat and migration corridors is summarized in Table 4-69.

TABLE 4-69 MULE DEER CRUCIAL/CRITICAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Crucial Spring/Fall Range						
COUT BAX-B	449,333	26,544	390	58	26,992	422,341
COUT BAX-C	458,539	27,996	409	57	28,462	430,077
COUT BAX-E	458,539	27,996	409	32	28,436	430,102
Crucial Summer/Summer Concentration						
COUT BAX-B	881,930	225,198	12,306	87	237,591	644,339
COUT BAX-C	1,090,463	246,874	13,564	85	260,522	829,940
COUT BAX-E	1,090,463	246,874	13,564	14	260,452	830,011
Crucial/Critical Winter Range						
COUT BAX-B	2,030,119	281,718	5,141	813	287,672	1,742,447
COUT BAX-C	2,232,236	293,880	5,244	799	299,923	1,932,313
COUT BAX-E	2,232,236	293,880	5,244	573	299,697	1,932,539
Crucial Winter/Spring Range						
COUT BAX-B	535,735	50,889	16,558	18	67,464	468,271
COUT BAX-C	535,735	50,889	16,558	18	67,464	468,271
COUT BAX-E	535,735	50,889	16,558	50	67,496	468,239
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated mule deer critical/severe range from any of the COUT BAX alternative routes would contribute to the cumulative loss, fragmentation, and degradation of mule deer critical/severe range in the CIAA (Table 4-69). Past and present actions in the CIAA for all

COUT BAX alternative routes that have affected designated mule deer critical/severe habitat include historical fires, oil and gas development, oil shale and tar sands development, coal mines, gypsum mines, pipelines, sand and gravel pits, mineral leases, residential and recreational development, communication facilities, habitat and rangeland management, and vegetation management. RFFAs in the CIAA for all COUT BAX alternative routes include oil and gas development, coal mines, gypsum mines, sand and gravel mining, construction of a reservoir, a dam, transportation, a tunnel, pipelines, power generation facilities, wind energy development; and the Gateway West, TransWest Express, Mona North and Mona South transmission lines. Potential impacts on mule deer populations in the CIAA from past and present actions and RFFAs could be a function of the type of action, and the scale, density and arrangement of each development in designated critical/severe habitat (Lutz et al. 2011).

Mule deer herds affected by the Project include the Book Cliffs (D-11) herd in Colorado, and the Central Mountains herd in Utah. The Book Cliffs herd has been in steady decline since 1990 and currently has a population of 8,600 animals (CDOW 2005a). The Central Mountains herd has a current population size of approximately 60,000 animals and is currently within management objectives (UDWR 2012a). Ongoing loss, fragmentation and alteration of sensitive habitat, increases in energy development and human activity, and the availability of critical/severe winter range are limiting factors for mule deer herds in the CIAA. Mule deer critical/severe winter range has been affected by a wider variety of past and present actions than any other designated mule deer critical/severe range in the CIAA, and is located in areas previously disturbed by past and present human activities; suggesting that local mule deer populations tolerate some level of human activity and habitat disturbance. Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong mule deer displacement from critical/severe habitat, and physiological stress in populations in proximity to the two projects; although impacts on mule deer would be subject to seasonal selective mitigation measures (refer to mule deer discussion for the WYCO alternative routes). Overall, the Project would contribute to past and future modification of mule deer critical/severe range, and the cumulative disturbance from all actions considered could contribute to ongoing loss, fragmentation and alteration of sensitive habitat in the CIAA that is necessary for maintaining local mule deer herds, including the Book Cliffs herd in Colorado, which already has a population decline due to habitat alteration and developmental pressure; and the Central Mountains herd in Utah that is at carrying capacity due to the poor condition of winter range on the management unit (CDOW 2005a; UDWR 2006c). However, the effects of the Project would be anticipated to be small compared to the effects of other actions (Table 4-69). Under all COUT BAX alternative routes, the majority of available mule deer critical/severe habitat in Colorado and Utah would remain undisturbed by the Project and other actions in the CIAA (Table 4-69).

Pronghorn

The estimated area (in acres) of cumulative development in pronghorn crucial/severe habitat is summarized in Table 4-70.

TABLE 4-70 PRONGHORN CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Fawning Areas						
COUT BAX-B	534,266	18,165	4,752	963	23,880	510,386
COUT BAX-C	602,519	20,418	4,821	855	26,094	576,425
COUT BAX-E	602,519	20,418	4,821	1,230	26,469	576,050
Crucial/Severe Winter Range						
COUT BAX-B	58,471	3,872	226	41	4,139	54,332
COUT BAX-C	58,471	3,872	226	40	4,139	54,332
COUT BAX-E	58,471	3,872	226	39	4,137	54,334
Crucial Year-long						
COUT BAX-B	1,093,553	124,748	5,343	963	131,055	962,499
COUT BAX-C	1,161,819	127,005	5,413	855	133,273	1,028,546
COUT BAX-E	1,161,819	127,005	5,413	1,269	133,687	1,028,132
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated pronghorn crucial/severe range from any of the COUT BAX alternative routes would contribute to the cumulative loss, fragmentation, and degradation of pronghorn crucial/severe range in the CIAA (Table 4-70). Past and present actions in the CIAA for all COUT BAX alternative routes that have affected designated pronghorn crucial/severe habitat include historical fires, oil and gas development, coal mines, residential development, wind energy development, and vegetation management. RFFAs in the CIAA for all COUT BAX alternative routes include oil and gas development, coal mines, wind-energy development, and the Gateway West and TransWest Express transmission lines. Potential impacts on pronghorn populations in the CIAA from past and present actions and RFFAs could be a function of the location and type of development in relation to the location of pronghorn designated crucial/severe habitat. Development that include fences or roads can restrict movement between seasonal ranges and watering and feeding areas (Sawyer et al. 2002), and could have greater impacts on pronghorn population viability in the CIAA than development that does not restrict their movement.

Ongoing loss, fragmentation and alteration of habitat from energy development, the availability of crucial/severe winter range, and the quality of spring/summer ranges are limiting factors for pronghorn in the CIAA (UDWR 2009b). Pronghorn crucial/severe range affected by any of the COUT BAX alternative routes is located in areas previously disturbed by past and present human activities; suggesting that local pronghorn populations tolerate some level of human activity and habitat disturbance. However, individual response of pronghorn to energy development can vary from tolerance to strong avoidance (Berger et al. 2007). Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong pronghorn displacement from critical/severe habitat in proximity to the two projects; although impacts on pronghorn would be subject to seasonal selective mitigation measures (refer to pronghorn discussion for the WYCO alternative routes). Overall, the Project would contribute to past and future modification of pronghorn crucial/severe range, and the cumulative disturbance from all actions considered could contribute to loss, fragmentation, and modification of resources limiting local pronghorn herds in the CIAA. However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-70). Under all COUT BAX alternative

routes, the majority of available pronghorn crucial/severe habitat would remain undisturbed by the Project and other actions in the CIAA (Table 4-70).

Moose

The estimated area (in acres) of cumulative development in moose crucial habitat is summarized in Table 4-71.

TABLE 4-71 MOOSE CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Calving Grounds						
COUT BAX-B	111,449	9,790	1,357	3	11,150	100,299
COUT BAX-C	111,449	9,790	1,357	3	11,150	100,299
COUT BAX-E	111,449	9,790	1,357	0	11,147	100,302
Crucial Winter Range						
COUT BAX-B	768,086	156,446	11,272	101	167,819	600,268
COUT BAX-C	900,003	177,502	12,873	99	190,474	709,529
COUT BAX-E	900,003	177,502	12,873	14	190,390	709,613
Crucial Year-long						
COUT BAX-B	111,449	9,790	1,357	3	11,150	100,299
COUT BAX-C	111,449	9,790	1,357	3	11,150	100,299
COUT BAX-E	111,449	9,790	1,357	0	11,147	100,302
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated moose crucial habitat from any of the COUT BAX alternative routes would contribute to the cumulative loss, fragmentation, and degradation of moose crucial habitat in the CIAA (Table 4-71). Past and present actions in the CIAA for all COUT BAX alternative routes that have affected designated moose crucial habitat include historical fires, oil and gas development, coal mines, sand and gravel mining, residential development, and vegetation management. RFFAs in the CIAA for all COUT BAX alternative routes include coal mines, vegetation management, and the TransWest Express transmission line.

The moose population in Utah is currently estimated at 3,200 animals, and populations have intentionally been reduced, particularly in northern Utah, since 2005 as they have reached or exceeded carrying capacity of available habitat (UDWR 2009a). Habitat degradation and the availability of quality crucial habitat are limiting factors for moose populations in the CIAA for all COUT BAX alternative routes. Moose crucial habitat affected by any of the COUT BAX alternative routes is located in areas previously disturbed by past and present human activities; suggesting that local moose populations tolerate human activity and habitat disturbance to some extent (UDWR 2009a). Disturbance from construction and stabilization of any of the COUT BAX alternative routes could overlap temporally with the construction and stabilization activities of the TransWest Express Transmission Project, and could result in synergistic temporal effects that prolong moose avoidance from crucial habitat in proximity to the two transmission lines. Impacts on moose from both transmission line projects would be minimized or avoided through implementation of seasonal restrictions. Overall, the Project would contribute to past and future modification of moose crucial habitat, and the cumulative disturbance from all actions considered could contribute to loss, modification, and fragmentation of crucial habitat limiting moose populations that may

already be exceeding carrying capacity of local resources in the CIAA. However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-71). Under all COUT BAX alternative routes, the majority of available moose crucial habitat would remain undisturbed by the Project and other actions in the CIAA (Table 4-71).

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Elk

The estimated area (in acres) of cumulative development in elk crucial/severe habitat is summarized in Table 4-72.

TABLE 4-72 ELK CRUCIAL/SEVERE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Calving Grounds						
Alternative COUT-A and Route Variation						
COUT-A	1,071,079	29,514	1,214	86	30,814	1,040,265
COUT-A-1	1,071,079	29,514	1,214	86	30,814	1,040,265
Alternative COUT-B and Route Variations						
COUT-B	1,128,397	37,014	1,805	40	38,860	1,089,537
COUT-B-1	1,128,397	37,014	1,805	41	38,860	1,089,536
COUT-B-2	1,128,397	37,014	1,805	41	38,860	1,089,537
COUT-B-3	1,128,397	37,014	1,805	41	38,860	1,089,537
COUT-B-4	1,128,397	37,014	1,805	41	38,860	1,089,537
COUT-B-5	1,128,397	37,014	1,805	42	38,861	1,089,536
Alternative COUT-C and Route Variations						
COUT-C	483,736	86,361	1,934	81	88,376	395,360
COUT-C-1	483,736	86,361	1,934	81	88,376	395,359
COUT-C-2	483,736	86,361	1,934	81	88,376	395,359
COUT-C-3 (Agency Preferred Alternative)	483,736	86,361	1,934	82	88,377	395,359
COUT-C-4	483,736	86,361	1,934	82	88,377	395,359
COUT-C-5	483,736	86,361	1,934	79	88,374	395,361
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	481,265	86,205	1,194	37	87,436	393,829
COUT-I	414,526	81,045	786	36	81,867	332,659
Crucial Spring/Fall Range						
Alternative COUT-A and Route Variation						
COUT-A	463,284	7,136	5,359	238	12,733	450,551
COUT-A-1	463,284	7,136	5,359	242	12,737	450,547
Alternative COUT-B and Route Variations						
COUT-B	463,284	7,136	5,359	40	12,536	450,748

TABLE 4-72 ELK CRUCIAL/SEVERE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-B-1	463,284	7,136	5,359	41	12,536	450,748
COUT-B-2	463,284	7,136	5,359	41	12,536	450,748
COUT-B-3	463,284	7,136	5,359	41	12,536	450,748
COUT-B-4	463,284	7,136	5,359	41	12,536	450,748
COUT-B-5	463,284	7,136	5,359	42	12,537	450,747
Alternative COUT-C and Route Variations						
COUT-C	460,397	6,983	5,359	42	12,384	448,013
COUT-C-1	460,397	6,983	5,359	43	12,384	448,013
COUT-C-2	460,397	6,983	5,359	43	12,384	448,013
COUT-C-3 (Agency Preferred Alternative)	460,397	6,983	5,359	43	12,384	448,012
COUT-C-4	460,397	6,983	5,359	43	12,384	448,012
COUT-C-5	460,397	6,983	5,359	42	12,383	448,014
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	274,779	4,895	131	0	5,026	269,753
COUT-I	147,774	3,733	66	0	3,799	143,975
Crucial Summer/Summer Concentration						
Alternative COUT-A and Route Variation						
COUT-A	1,696,168	140,924	10,608	118	151,651	1,544,518
COUT-A-1	1,696,168	140,924	10,608	118	151,651	1,544,518
Alternative COUT-B and Route Variations						
COUT-B	1,916,696	165,370	10,970	1	176,341	1,740,355
COUT-B-1	1,916,696	165,370	10,970	0	176,340	1,740,356
COUT-B-2	1,916,696	165,370	10,970	0	176,340	1,740,357
COUT-B-3	1,916,696	165,370	10,970	0	176,340	1,740,357
COUT-B-4	1,916,696	165,370	10,970	0	176,340	1,740,357
COUT-B-5	1,916,696	165,370	10,970	0	176,340	1,740,357
Alternative COUT-C and Route Variations						
COUT-C	1,272,035	214,716	11,099	2	225,817	1,046,218
COUT-C-1	1,272,035	214,716	11,099	0	225,815	1,046,220
COUT-C-2	1,272,035	214,716	11,099	0	225,815	1,046,220
COUT-C-3 (Agency Preferred Alternative)	1,272,035	214,716	11,099	0	225,815	1,046,220
COUT-C-4	1,272,035	214,716	11,099	0	225,815	1,046,220
COUT-C-5	1,272,035	214,716	11,099	0	225,815	1,046,220

TABLE 4-72 ELK CRUCIAL/SEVERE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	1,215,059	212,171	10,354	55	222,580	992,479
COUT-I	1,087,291	203,773	9,620	222	213,615	873,676
Crucial/Severe Winter Range						
Alternative COUT-A and Route Variation						
COUT-A	1,504,761	242,009	8,596	797	251,402	1,253,359
COUT-A-1	1,504,761	242,009	8,596	797	251,402	1,253,360
Alternative COUT-B and Route Variations						
COUT-B	1,742,057	252,313	9,266	591	262,170	1,479,887
COUT-B-1	1,742,057	252,313	9,266	639	262,218	1,479,839
COUT-B-2	1,742,057	252,313	9,266	704	262,282	1,479,774
COUT-B-3	1,742,057	252,313	9,266	690	262,268	1,479,788
COUT-B-4	1,742,057	252,313	9,266	716	262,295	1,479,762
COUT-B-5	1,742,057	252,313	9,266	693	262,272	1,479,785
Alternative COUT-C and Route Variations						
COUT-C	1,706,074	242,494	9,813	619	252,926	1,453,147
COUT-C-1	1,706,074	242,494	9,813	671	252,978	1,453,096
COUT-C-2	1,706,074	242,494	9,813	738	253,045	1,453,029
COUT-C-3 (Agency Preferred Alternative)	1,706,074	242,494	9,813	717	253,024	1,453,050
COUT-C-4	1,706,074	242,494	9,813	793	253,100	1,452,973
COUT-C-5	1,706,074	242,494	9,813	741	253,048	1,453,026
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	1,647,606	236,594	9,535	211	246,339	1,401,267
COUT-I	1,332,277	206,963	8,467	379	215,810	1,116,467
Crucial Year-long						
Alternative COUT-A and Route Variation						
COUT-A	136,718	8,611	1,518	45	10,174	126,544
COUT-A-1	136,718	8,611	1,518	45	10,174	126,544
Alternative COUT-B and Route Variations						
COUT-B	250,328	20,302	2,109	44	22,455	227,873
COUT-B-1	250,328	20,302	2,109	67	22,478	227,850
COUT-B-2	250,328	20,302	2,109	67	22,478	227,850
COUT-B-3	250,328	20,302	2,109	67	22,478	227,850
COUT-B-4	250,328	20,302	2,109	67	22,478	227,850
COUT-B-5	250,328	20,302	2,109	69	22,479	227,849

TABLE 4-72 ELK CRUCIAL/SEVERE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	257,112	21,293	2,109	85	23,486	233,626
COUT-C-1	257,112	21,293	2,109	109	23,510	233,601
COUT-C-2	257,112	21,293	2,109	109	23,510	233,602
COUT-C-3 (Agency Preferred Alternative)	257,112	21,293	2,109	110	23,511	233,601
COUT-C-4	257,112	21,293	2,109	110	23,511	233,601
COUT-C-5	257,112	21,293	2,109	106	23,508	233,604
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	251,442	21,060	1,368	37	22,465	228,977
COUT-I	183,399	15,847	939	105	16,891	166,508
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated elk crucial and severe range from any of the COUT alternative routes and route variations would contribute to the cumulative loss, fragmentation, and degradation of elk crucial and severe habitat in the CIAA (Table 4-72). Elk crucial spring/fall habitat would not be affected by Alternatives COUT-H and COUT-I. Past and present actions in the CIAA for all COUT alternative routes that have affected designated elk crucial/severe habitat include historical fires, oil and gas development, oil shale and tar sands development, sand and gravel pits, pipelines, coal mines, mineral development, residential development, communication facilities, and habitat/rangeland and vegetation management. RFFAs in the CIAA include coal mines, oil and gas development, construction of a tunnel, transportation infrastructure, a dam, and pipelines, residential development, development of recreation sites, and the TransWest Express Transmission Project.

In Utah, elk that could be affected by the COUT alternative routes include the Wasatch Mountains elk herd, which had an estimated population of 6,478 animals in 2011; and is currently over the management objective of 5,400 animals (UDWR 2012a). Limiting factors to local elk herds in the CIAA include range conditions, energy development and urban expansion, and alteration and fragmentation of sensitive habitat (UDWR 2012a). Elk crucial/severe range would be most affected by any of the COUT alternative routes, but is located in areas previously disturbed by past and present human activities, suggesting that local elk populations have some level of tolerance towards human activity and habitat disturbance. Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong elk displacement from crucial/severe habitat in proximity to the two projects; although impacts on elk would be subject to seasonal selective mitigation measures (refer to elk discussion for the WYCO alternative routes). Overall, the Project would contribute to past and future modification of elk crucial habitat and the cumulative disturbance from all actions considered could contribute to loss, fragmentation, and modification of sensitive habitats that limit local elk herds, including the Wasatch Mountains elk herd that is currently above management objectives due to resource

pressure in the CIAA. However, the effects of the Project would be anticipated to be small compared to the effects of other actions (Table 4-72). Under all COUT alternative routes, the majority of available elk crucial/severe range and calving grounds would remain undisturbed by the Project and other actions in the CIAA (Table 4-72).

Mule Deer

The estimated area (in acres) of cumulative development in mule deer crucial/severe habitat is summarized in Table 4-73.

TABLE 4-73 MULE DEER CRUCIAL/CRITICAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Crucial Spring/Fall Range						
Alternative COUT-A and Route Variation						
COUT-A	449,333	26,544	390	80	27,014	422,320
COUT-A-1	449,333	26,544	390	80	27,014	422,320
Alternative COUT-B and Route Variations						
COUT-B	459,862	28,182	409	79	28,669	431,193
COUT-B-1	459,862	28,182	409	79	28,670	431,192
COUT-B-2	459,862	28,182	409	79	28,669	431,192
COUT-B-3	459,862	28,182	409	79	28,669	431,192
COUT-B-4	459,862	28,182	409	79	28,669	431,192
COUT-B-5	459,862	28,182	409	81	28,671	431,190
Alternative COUT-C and Route Variations						
COUT-C	459,862	28,182	409	83	28,673	431,189
COUT-C-1	459,862	28,182	409	83	28,673	431,188
COUT-C-2	459,862	28,182	409	83	28,673	431,188
COUT-C-3 (Agency Preferred Alternative)	459,862	28,182	409	84	28,674	431,188
COUT-C-4	459,862	28,182	409	84	28,674	431,188
COUT-C-5	459,862	28,182	409	81	28,671	431,190
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	459,862	28,182	409	36	28,626	431,236
COUT-I	459,862	28,182	409	61	28,652	431,210
Crucial Summer/Summer Concentration						
Alternative COUT-A and Route Variation						
COUT-A	2,254,072	222,364	19,189	303	241,855	2,012,217
COUT-A-1	2,254,072	222,364	19,189	307	241,859	2,012,213

TABLE 4-73 MULE DEER CRUCIAL/CRITICAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-B and Route Variations						
COUT-B	2,495,212	249,685	20,520	20	270,225	2,224,987
COUT-B-1	2,495,212	249,685	20,520	175	270,380	2,224,832
COUT-B-2	2,495,212	249,685	20,520	227	270,432	2,224,780
COUT-B-3	2,495,212	249,685	20,520	164	270,369	2,224,843
COUT-B-4	2,495,212	249,685	20,520	267	270,472	2,224,740
COUT-B-5	2,495,212	249,685	20,520	126	270,332	2,224,881
Alternative COUT-C and Route Variations						
COUT-C	1,770,129	274,607	20,520	21	295,148	1,474,981
COUT-C-1	1,770,129	274,607	20,520	220	295,347	1,474,782
COUT-C-2	1,770,129	274,607	20,520	274	295,401	1,474,728
COUT-C-3 (Agency Preferred Alternative)	1,770,129	274,607	20,520	167	295,294	1,474,835
COUT-C-4	1,770,129	274,607	20,520	488	295,615	1,474,514
COUT-C-5	1,770,129	274,607	20,520	367	295,494	1,474,636
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	1,489,152	265,229	15,903	16	281,148	1,208,004
COUT-I	1,072,742	248,296	13,637	190	262,123	810,619
Crucial/Critical Winter Range						
Alternative COUT-A and Route Variation						
COUT-A	1,824,165	321,914	5,399	722	328,034	1,496,131
COUT-A-1	1,824,165	321,914	5,399	721	328,034	1,496,131
Alternative COUT-B and Route Variations						
COUT-B	2,067,765	337,067	5,641	483	343,191	1,724,574
COUT-B-1	2,067,765	337,067	5,641	489	343,197	1,724,568
COUT-B-2	2,067,765	337,067	5,641	489	343,196	1,724,568
COUT-B-3	2,067,765	337,067	5,641	488	343,196	1,724,569
COUT-B-4	2,067,765	337,067	5,641	488	343,196	1,724,569
COUT-B-5	2,067,765	337,067	5,641	500	343,208	1,724,557
Alternative COUT-C and Route Variations						
COUT-C	2,003,345	338,752	5,819	488	345,058	1,658,286
COUT-C-1	2,003,345	338,752	5,819	495	345,065	1,658,279
COUT-C-2	2,003,345	338,752	5,819	493	345,064	1,658,281
COUT-C-3 (Agency Preferred Alternative)	2,003,345	338,752	5,819	498	345,069	1,658,276
COUT-C-4	2,003,345	338,752	5,819	498	345,068	1,658,276
COUT-C-5	2,003,345	338,752	5,819	482	345,052	1,658,292

TABLE 4-73 MULE DEER CRUCIAL/CRITICAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	1,967,178	332,709	5,590	319	338,619	1,628,559
COUT-I	1,718,109	297,671	4,974	586	303,231	1,414,878
Crucial Winter/Spring Range						
Alternative COUT-A and Route Variation						
COUT-A	608,008	56,184	18,736	309	75,229	532,780
COUT-A-1	608,008	56,184	18,736	309	75,228	532,780
Alternative COUT-B and Route Variations						
COUT-B	608,008	56,184	18,736	286	75,206	532,802
COUT-B-1	608,008	56,184	18,736	288	75,208	532,801
COUT-B-2	608,008	56,184	18,736	288	75,207	532,801
COUT-B-3	608,008	56,184	18,736	287	75,207	532,801
COUT-B-4	608,008	56,184	18,736	287	75,207	532,801
COUT-B-5	608,008	56,184	18,736	294	75,214	532,794
Alternative COUT-C and Route Variations						
COUT-C	608,008	56,184	18,736	300	75,220	532,789
COUT-C-1	608,008	56,184	18,736	302	75,222	532,786
COUT-C-2	608,008	56,184	18,736	302	75,221	532,787
COUT-C-3 (Agency Preferred Alternative)	608,008	56,184	18,736	304	75,224	532,784
COUT-C-4	608,008	56,184	18,736	304	75,224	532,784
COUT-C-5	608,008	56,184	18,736	294	75,214	532,794
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	537,287	51,103	16,591	56	67,750	469,537
COUT-I	535,735	50,889	16,558	19	67,465	468,270
Crucial Year-long						
Alternative COUT-A and Route Variation						
COUT-A	262,529	102,193	326	48	102,567	159,962
COUT-A-1	262,529	102,193	326	48	102,567	159,962
Alternative COUT-B and Route Variations						
COUT-B	310,384	112,499	506	30	113,035	197,349
COUT-B-1	310,384	112,499	506	30	113,035	197,349
COUT-B-2	310,384	112,499	506	30	113,035	197,349
COUT-B-3	310,384	112,499	506	30	113,035	197,349
COUT-B-4	310,384	112,499	506	30	113,035	197,349
COUT-B-5	310,384	112,499	506	31	113,036	197,348

TABLE 4-73 MULE DEER CRUCIAL/CRITICAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	163,180	37,605	332	28	37,965	125,215
COUT-C-1	163,180	37,605	332	28	37,965	125,215
COUT-C-2	163,180	37,605	332	28	37,965	125,215
COUT-C-3 (Agency Preferred Alternative)	163,180	37,605	332	29	37,965	125,215
COUT-C-4	163,180	37,605	332	29	37,965	125,215
COUT-C-5	163,180	37,605	332	377	38,314	124,866
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	163,180	37,605	332	369	38,306	124,874
COUT-I	189,929	29,444	4,139	364	33,947	155,982
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated mule deer crucial/critical range from any of the COUT alternative routes would contribute to the cumulative loss, fragmentation, and degradation of mule deer crucial/critical range in the CIAA (Table 4-73). Past and present actions in the CIAA for all COUT alternative routes that have affected designated mule deer crucial/critical habitat include historical fires, oil and gas development, oil shale and tar sands development, coal mines, gypsum mines, construction of pipelines, sand and gravel pits, mineral leasing activities, residential development, construction of educational and communication facilities, habitat and rangeland management, and vegetation management. RFFAs in the CIAA for all COUT alternative routes include oil and gas development, coal mining, gypsum mining, sand and gravel mining, construction of a reservoir, transportation infrastructure, a helicopter port, a tunnel, pipelines, and power generation facilities including wind energy development, vegetation management; and TransWest Express, Mona North and Mona South transmission lines. Potential impacts on mule deer populations in the CIAA from past and present actions and RFFAs would be a function of the type of action, and the scale, density and arrangement of each development in designated crucial/critical habitat (Lutz et al. 2011).

In Utah, mule deer that could be affected by the Project include the Wasatch Mountains herd, which has a current population size of 31,200, but a target population of 40,800 (UDWR 2006d). The availability and quality of crucial/critical winter range is a limiting factor for mule deer herds in the CIAA for all COUT alternative routes. Mule deer crucial/critical winter range is located in areas previously disturbed by past and present human activities; suggesting that local mule deer populations tolerate some level of human activity and habitat disturbance. The majority of mule deer crucial year-long habitat follows natural river systems, which provide some protection for mule deer from development in the CIAA. Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong mule deer displacement from crucial/severe habitat, and increase physiological stress in populations in proximity to the two projects; although impacts on mule deer would

be subject to seasonal selective mitigation measures (refer to mule deer discussion for the WYCO alternative routes). Overall, the Project would contribute to past and future modification of mule deer crucial/critical range, and the cumulative disturbance from all actions considered could contribute to loss, fragmentation, and modification of habitats that currently limit local mule deer herds, including the Wasatch Mountains mule deer herd that use winter range with decreasing DCI scores (15 percent over the last 5 years) (UDWR 2006d). However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-73). Under all COUT BAX alternative routes, the majority of available mule deer crucial/critical habitat in Colorado and Utah would remain undisturbed by the Project and other actions in the CIAA (Table 4-73).

Pronghorn

The estimated area (in acres) of cumulative development in pronghorn crucial/severe habitat is summarized in Table 4-74.

TABLE 4-74 PRONGHORN CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Fawning Areas						
Alternative COUT-A and Route Variation						
COUT-A	421,678	43,186	2,076	400	45,662	376,016
COUT-A-1	421,678	43,186	2,076	400	45,662	376,016
Alternative COUT-B and Route Variations						
COUT-B	728,872	57,979	8,852	396	67,226	661,646
COUT-B-1	728,872	57,979	8,852	398	67,229	661,644
COUT-B-2	728,872	57,979	8,852	398	67,228	661,644
COUT-B-3	728,872	57,979	8,852	398	67,228	661,644
COUT-B-4	728,872	57,979	8,852	397	67,228	661,645
COUT-B-5	728,872	57,979	8,852	407	67,237	661,635
Alternative COUT-C and Route Variations						
COUT-C	858,879	91,669	10,940	574	103,183	755,695
COUT-C-1	858,879	91,669	10,940	579	103,188	755,691
COUT-C-2	858,879	91,669	10,940	578	103,187	755,692
COUT-C-3 (Agency Preferred Alternative)	858,879	91,669	10,940	583	103,192	755,687
COUT-C-4	858,879	91,669	10,940	583	103,191	755,687
COUT-C-5	858,879	91,669	10,940	564	103,173	755,706
Alternative COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	858,879	91,669	10,940	552	103,161	755,718
COUT-I	1,121,237	98,636	13,939	807	113,382	1,007,855

TABLE 4-74 PRONGHORN CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Crucial Year-long						
Alternative COUT-A and Route Variation						
COUT-A	597,487	147,481	2,667	400	150,549	446,938
COUT-A-1	597,487	147,481	2,667	400	150,549	446,938
Alternative COUT-B and Route Variations						
COUT-B	918,159	164,876	9,497	396	174,769	743,390
COUT-B-1	918,159	164,876	9,497	398	174,771	743,388
COUT-B-2	918,159	164,876	9,497	398	174,771	743,388
COUT-B-3	918,159	164,876	9,497	398	174,770	743,388
COUT-B-4	918,159	164,876	9,497	397	174,770	743,389
COUT-B-5	918,159	164,876	9,497	407	174,780	743,379
Alternative COUT-C and Route Variations						
COUT-C	1,048,165	198,566	11,585	574	210,726	837,440
COUT-C-1	1,048,165	198,566	11,585	579	210,731	837,435
COUT-C-2	1,048,165	198,566	11,585	578	210,729	837,436
COUT-C-3 (Agency Preferred Alternative)	1,048,165	198,566	11,585	583	210,734	837,431
COUT-C-4	1,048,165	198,566	11,585	583	210,734	837,431
COUT-C-5	1,048,165	198,566	11,585	564	210,716	837,450
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	1,048,165	198,566	11,585	552	210,704	837,462
COUT-I	1,693,999	207,820	14,584	865	223,270	1,470,729
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated pronghorn crucial/severe range from any of the COUT alternative routes and route variations would contribute to the cumulative loss, fragmentation, and degradation of pronghorn crucial/severe range in the CIAA (Table 4-74). Past and present actions in the CIAA for all COUT alternative routes that have affected designated pronghorn crucial/severe habitat include historical fires, oil and gas development, oil shale and tar sands development, coal mining, development of recreation sites, construction of transportation infrastructure, military training, mineral leasing, habitat/rangeland management, and vegetation management. RFFAs in the CIAA for all COUT alternative routes and route variations include oil and gas development, construction of power generation facilities, development of recreation sites, and the TransWest Express transmission line. Potential impacts on pronghorn populations in the CIAA from past and present actions and RFFAs could be a function of the location and type of development in relation to the location of pronghorn designated crucial/severe habitat and migration corridors. Development that include fences or roads can sever pronghorn migration corridors; and restrict movement between seasonal ranges and watering and feeding areas (Sawyer et al. 2002), and could have greater impacts on pronghorn population viability in the CIAA than development that does not restrict their movement.

In Utah the current statewide pronghorn population is estimated at 12,000 to 14,000 animals in 29 subpopulations (UDWR 2009b). Ongoing loss, fragmentation and alteration of habitat from energy development, the availability of crucial/severe winter range, water and quality spring forage are limiting factors for pronghorn in the CIAA (UDWR 2009b). Pronghorn crucial/severe range affected by any of the COUT alternative routes and route variations is located in areas previously disturbed by past and present human activities; suggesting that local pronghorn populations tolerate some level of human activity and habitat disturbance. However, individual response of pronghorn to energy development can vary from tolerance to strong avoidance (Berger et al. 2007). Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong pronghorn displacement from crucial/severe habitat in proximity to the two projects; although impacts on pronghorn would be subject to seasonal selective mitigation measures (refer to pronghorn discussion for the WYCO alternative routes). Overall, the Project would contribute to past and future modification of pronghorn crucial/severe range, and the cumulative disturbance from all actions considered could contribute to loss, fragmentation, and modification of limiting resources for local pronghorn herds in the CIAA. However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-74). Under all COUT alternative routes and route variations, the majority of available pronghorn crucial/severe habitat and migration corridors would remain undisturbed by the Project and other actions in the CIAA (Table 4-74).

Moose

The estimated area (in acres) of cumulative development in moose crucial habitat is summarized in Table 4-75.

TABLE 4-75 MOOSE CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Calving Grounds						
Alternative COUT-A and Route Variation						
COUT-A	238,515	13,082	1,454	0	14,535	223,980
COUT-A-1	238,515	13,082	1,454	0	14,535	223,980
Alternative COUT-B and Route Variations						
COUT-B	238,515	13,082	1,454	37	14,572	223,943
COUT-B-1	238,515	13,082	1,454	42	14,577	223,938
COUT-B-2	238,515	13,082	1,454	42	14,577	223,938
COUT-B-3	238,515	13,082	1,454	42	14,577	223,938
COUT-B-4	238,515	13,082	1,454	42	14,577	223,938
COUT-B-5	238,515	13,082	1,454	43	14,578	223,937

TABLE 4-75 MOOSE CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	238,515	13,082	1,454	39	14,574	223,941
COUT-C-1	238,515	13,082	1,454	44	14,579	223,936
COUT-C-2	238,515	13,082	1,454	44	14,579	223,936
COUT-C-3 (Agency Preferred Alternative)	238,515	13,082	1,454	44	14,579	223,936
COUT-C-4	238,515	13,082	1,454	44	14,579	223,936
COUT-C-5	238,515	13,082	1,454	43	14,578	223,937
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	147,993	10,372	1,451	0	11,823	136,170
COUT-I	111,449	9,790	1,357	3	11,150	100,299
Crucial Spring/Fall Range						
Alternative COUT-A and Route Variation						
COUT-A	187,874	7,797	5,636	209	13,641	174,232
COUT-A-1	187,874	7,797	5,636	213	13,646	174,228
Alternative COUT-B and Route Variations						
COUT-B	187,874	7,797	5,636	0	13,433	174,441
COUT-B-1	187,874	7,797	5,636	0	13,433	174,441
COUT-B-2	187,874	7,797	5,636	0	13,433	174,441
COUT-B-3	187,874	7,797	5,636	0	13,433	174,441
COUT-B-4	187,874	7,797	5,636	0	13,433	174,441
COUT-B-5	187,874	7,797	5,636	0	13,433	174,441
Alternative COUT-C and Route Variations						
COUT-C	187,874	7,797	5,636	0	13,433	174,441
COUT-C-1	187,874	7,797	5,636	0	13,433	174,441
COUT-C-2	187,874	7,797	5,636	0	13,433	174,441
COUT-C-3 (Agency Preferred Alternative)	187,874	7,797	5,636	0	13,433	174,441
COUT-C-4	187,874	7,797	5,636	0	13,433	174,441
COUT-C-5	187,874	7,797	5,636	0	13,433	174,441
Alternative COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	4,977	35	6	0	41	4,936
COUT-I	0	0	0	0	0	0

TABLE 4-75 MOOSE CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Severe Winter Range						
Alternative COUT-A and Route Variation						
COUT-A	1,177,119	180,437	12,892	194	193,524	983,595
COUT-A-1	1,177,119	180,437	12,892	194	193,524	983,595
Alternative COUT-B and Route Variations						
COUT-B	1,319,148	201,607	14,579	29	216,215	1,102,933
COUT-B-1	1,319,148	201,607	14,579	182	216,368	1,102,780
COUT-B-2	1,319,148	201,607	14,579	235	216,420	1,102,728
COUT-B-3	1,319,148	201,607	14,579	171	216,357	1,102,791
COUT-B-4	1,319,148	201,607	14,579	274	216,460	1,102,688
COUT-B-5	1,319,148	201,607	14,579	134	216,320	1,102,828
Alternative COUT-C and Route Variations						
COUT-C	1,224,449	200,294	14,579	55	214,928	1,009,521
COUT-C-1	1,224,449	200,294	14,579	252	215,125	1,009,324
COUT-C-2	1,224,449	200,294	14,579	306	215,180	1,009,270
COUT-C-3 (Agency Preferred Alternative)	1,224,449	200,294	14,579	200	215,073	1,009,376
COUT-C-4	1,224,449	200,294	14,579	548	215,421	1,009,028
COUT-C-5	1,224,449	200,294	14,579	425	215,298	1,009,151
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	1,213,836	199,571	14,440	39	214,050	999,786
COUT-I	910,115	177,615	12,958	284	190,857	719,258
Crucial Year-long						
Alternative COUT-A and Route Variation						
COUT-A	1,100,932	53,710	1,451	0	55,161	1,045,771
COUT-A-1	1,100,932	53,710	1,451	0	55,161	1,045,771
Alternative COUT-B and Route Variations						
COUT-B	1,100,932	53,710	1,451	37	55,198	1,045,734
COUT-B-1	1,100,932	53,710	1,451	42	55,203	1,045,729
COUT-B-2	1,100,932	53,710	1,451	42	55,203	1,045,729
COUT-B-3	1,100,932	53,710	1,451	42	55,203	1,045,729
COUT-B-4	1,100,932	53,710	1,451	42	55,203	1,045,729
COUT-B-5	1,100,932	53,710	1,451	43	55,204	1,045,728

TABLE 4-75 MOOSE CRUCIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	190,266	11,134	1,451	39	12,624	177,643
COUT-C-1	190,266	11,134	1,451	44	12,629	177,638
COUT-C-2	190,266	11,134	1,451	44	12,629	177,638
COUT-C-3 (Agency Preferred Alternative)	190,266	11,134	1,451	44	12,629	177,638
COUT-C-4	190,266	11,134	1,451	44	12,629	177,638
COUT-C-5	190,266	11,134	1,451	43	12,627	177,639
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	153,733	10,419	1,451	0	11,870	141,863
COUT-I	111,449	9,790	1,357	3	11,150	100,299
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated moose crucial habitat from any of the COUT alternative routes and route variations would contribute to the cumulative loss, fragmentation, and degradation of moose crucial habitat in the CIAA; with the exception that COUT-A, and Route Variation COUT-A-1, which would not affect designated moose calving grounds or crucial year-long habitat (Table 4-75). Moose crucial spring/fall habitat would be affected only by COUT-A and Route Variation COUT-A-1. Past and present actions in the CIAA for all COUT alternative routes and route variations that have affected designated moose crucial habitat include historical fires, oil and gas development, coal mining, mineral leasing, residential development, habitat/rangeland management, and vegetation management. RFFAs in the CIAA for all COUT alternative routes include coal mining, vegetation management, construction of transportation infrastructure, residential development, and the TransWest Express transmission line.

The moose population in Utah is currently estimated at 3,200 animals, and populations have intentionally been reduced, particularly in northern Utah, since 2005 as they have reached or exceeded carrying capacity of available habitat (UDWR 2009a). Habitat degradation and the availability of quality crucial habitat are limiting factors for moose populations in the CIAA for all COUT alternative routes. Moose crucial habitat affected by any of the COUT alternative routes and route variations is located in areas previously disturbed by past and present human activities; suggesting that local moose populations tolerate human activity and habitat disturbance to some extent (UDWR 2009a). Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong moose displacement from crucial/severe habitat in proximity to the two projects; although impacts on moose would be subject to seasonal selective mitigation measures (refer to moose discussion for the COUT BAX alternative routes). Overall, the Project would contribute to past and future modification of moose crucial habitat, and the cumulative disturbance from all actions considered could contribute to loss, fragmentation and degradation of habitat that limits local moose populations that are

currently above carrying capacity of local resources in the CIAA. However, the effects of the Project would be anticipated to be small compared to the effects of other actions (Table 4-75). Under all COUT alternative routes and route variations, the majority of available moose crucial habitat would remain undisturbed by the Project and other actions in the CIAA (Table 4-75).

Rocky Mountain Bighorn Sheep

The estimated area (in acres) of cumulative disturbance on Rocky Mountain bighorn sheep crucial habitat is summarized in Table 4-76.

TABLE 4-76 ROCKY MOUNTAIN BIGHORN SHEEP CRUCIAL YEAR-LONG HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	544,197	22,544	1,824	0	24,368	519,829
COUT-A-1	544,197	22,544	1,824	0	24,368	519,829
Alternative COUT-B and Route Variations						
COUT-B	895,479	41,959	1,901	0	43,860	851,619
COUT-B-1	895,479	41,959	1,901	0	43,860	851,619
COUT-B-2	895,479	41,959	1,901	0	43,860	851,619
COUT-B-3	895,479	41,959	1,901	0	43,860	851,619
COUT-B-4	895,479	41,959	1,901	0	43,860	851,619
COUT-B-5	895,479	41,959	1,901	0	43,860	851,619
Alternative COUT-C and Route Variations						
COUT-C	1,211,652	110,070	2,176	62	112,308	1,099,344
COUT-C-1	1,211,652	110,070	2,176	63	112,309	1,099,343
COUT-C-2	1,211,652	110,070	2,176	62	112,309	1,099,343
COUT-C-3 (Agency Preferred Alternative)	1,211,652	110,070	2,176	63	112,309	1,099,343
COUT-C-4	1,211,652	110,070	2,176	63	112,309	1,099,343
COUT-C-5	1,211,652	110,070	2,176	61	112,307	1,099,345
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	1,201,175	108,667	813	60	109,540	1,091,636
COUT-I	1,041,340	98,355	394	59	98,808	942,532
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation and modification of designated Rocky Mountain bighorn sheep crucial year-long habitat from any of the COUT alternative routes and route variations would contribute to the cumulative loss, fragmentation and degradation of Rocky Mountain bighorn sheep crucial habitat in the CIAA; with the exception that COUT-A and COUT-B and route variations, which would not affect crucial year-long habitat (Table 4-76). Past and present actions in the CIAA for all COUT alternative routes and route variations that have affected designated Rocky Mountain bighorn sheep crucial year-long habitat include

historical fires, oil and gas development, oil shale and tar sands development, coal mining, construction of pipelines, mineral leasing, and development of educational areas, habitat/rangeland management, and vegetation management. RFFAs in the CIAA for all COUT alternative routes include oil and gas development, residential development, and the TransWest Express transmission line.

In Utah, restoration efforts for Rocky Mountain bighorn sheep over the last 40 years have included transplanting animals (approximately 900 animals) to suitable habitat in the state. Many of those transplants have failed, and the current estimated population in Utah is 1,900 sheep (UDWR 2008c). Limiting factors for Rocky Mountain bighorn sheep in the CIAA include loss of crucial habitat due to development, forage competition with ungulates, extreme weather, predation and disease (UDWR 2008a). Loss of quality habitat has corresponded with a reduction in Rocky Mountain bighorn sheep population numbers across its range (Beecham et al. 2007; Deforge 1972). A portion of Rocky Mountain bighorn sheep crucial year-long habitat affected by any of the COUT alternative routes and route variations is located in areas previously disturbed by past and present human activities. Rocky Mountain sheep can habituate to human activity and presence if activity is somewhat predictable temporally and spatially, but can be adversely affected by less predictable actions (such as recreation, or development), which can result in a change in area use, abandonment of ranges and disease onset through physiological stress (UDWR 2008c). The majority of crucial year-long habitat follows natural river systems, which provide some protection for Rocky Mountain bighorn sheep from development in the CIAA. Disturbance from construction and stabilization of any of the COUT alternative routes could overlap temporally with the construction and stabilization activities of the TransWest Express Transmission Project, and could result in synergistic temporal effects that prolong Rocky Mountain bighorn sheep avoidance from crucial habitat in proximity to the two transmission lines. Impacts on Rocky Mountain bighorn sheep from both transmission line projects would be minimized or avoided through implementation of seasonal restrictions. Overall, the Project would contribute to past and future modification of Rocky Mountain bighorn sheep crucial year-long habitat, and the cumulative disturbance from all actions considered could contribute to loss of crucial habitat, and a reduction in habitat quality that currently limits Rocky Mountain bighorn sheep populations in the CIAA, and which has been linked to corresponding losses in bighorn populations (Deforge 1972). However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-76). Under all COUT alternative routes and route variations, the majority of available Rocky Mountain bighorn sheep crucial year-long habitat would remain undisturbed by the Project and other actions in the CIAA (Table 4-76).

4.3.8 Special Status Wildlife

The section addresses potential cumulative effects of the Project in addition to other past, other present, and RFFAs on special status wildlife resources. Resources addressed in this section are those described in Section 3.2.8.

The approach used to analyze cumulative effects on special status wildlife resources, including the geographic and temporal scopes of analysis, is presented in Table 4-3. The cumulative impacts analysis for special status wildlife considers direct and indirect impacts from the Project (described in Section 3.2.8) in conjunction with the past, present, RFFAs listed in Tables 4-1 and 4-2. Potential habitat models, known greater sage-grouse habitat, and lek location data were used to assess cumulative effects on special status wildlife, and were obtained from BLM, WGFD, CPW, and UDWR (Table 4-77). For instances where limited data were available for a given special status wildlife species likely to occur in the Project area, a qualitative evaluation of the potential cumulative effects was performed. For information regarding species life history and a list of species that may potentially occur in the Project area that support the analysis of cumulative effects, refer to Section 3.2.7.4 and Appendix E.

CIAAs were established for special status wildlife based on available information regarding species-specific home range or territory sizes. The geographic scope for analysis of cumulative effects on special status wildlife resources is identified by species in Table 4-77. For the purposes of this analysis, home ranges/territories were assumed to be circular; CIAAs include the 250-foot-wide right-of-way for each alternative route and the adjacent potentially suitable habitat in a distance equal to one home range/territory diameter on either side of the right-of-way to encompass habitat area used by all affected individuals of a given species in its territory or home range distance from the right-of-way.

4.3.8.1 Issues Identified for Analysis

4.3.8.1.1 Loss, Modification, and Fragmentation of Special Status Species Habitat

The effects of the Project could contribute (to varying degrees) to existing and ongoing loss, fragmentation, and modification of vegetation and terrain that provide potential habitat for special status wildlife. The quality and quantity of special status wildlife habitats (e.g., riparian corridors that support southwestern willow flycatchers and contiguous sagebrush habitats that support sage-grouse) are necessary for maintaining viable populations of special status wildlife species. Direct and indirect effects of any one past, present, or future action may not affect special status wildlife species or their habitat to the degree that existing populations would be affected. The combined incremental effects of all past, present, and future actions, however, could be extensive and occur over the majority of the available habitat in the Project area for some special status wildlife species. The modification and fragmentation of special status wildlife habitats potentially could result in shifts in species composition and diversity in the Project area.

An analysis of the Project's impacts relative to USFS LRMP standards and guidelines including thresholds for disturbance to designated sage-grouse habitat on USFS-administered land are included in the Wildlife Specialist Report (USFS 2013c).

4.3.8.1.2 Long-term Persistence of Special Status Wildlife in the Project Area

Due to a growing concern for the long-term persistence of species in areas of overlapping past, other present, and RFFAs, special status wildlife issues have been identified by resource agencies.

Long-term persistence of special status wildlife populations in the Project area could be threatened through cumulative detrimental direct and indirect impacts of past, present, and future actions to individuals and populations (refer to Section 3.2.8.4). Long-term persistence of special status wildlife also could be adversely affected if biological thresholds, such as minimum effective territory size (Ehrlich et al. 1988) and dispersal distances or minimum patch size and connectivity between suitable habitats (Oliver 2004), are no longer met due to the combined cumulative impacts of past, present, and future actions occurring in the CIAAs.

4.3.8.1.3 Synergistic Temporal Effects with Other Actions

The potential for synergistic (interaction and compounded) adverse effects on special status wildlife resulting from the construction of the Project and the TransWest Express Project was identified by the agencies and public during scoping. This analysis assumes the selected route for the Project and the selected routes for the TransWest Express Project would be located in the same 2-mile-wide study corridor offset by approximately 1,500 feet. Construction of the Project would potentially overlap construction and site stabilization efforts for the TransWest Express Project. Overlapping or repeated disturbance during construction and reclamation periods for the two projects could result in prolonged displacement of special status wildlife from important habitats, displacement of species from a larger geographic area, alteration of special status wildlife behavior or movement patterns, and could extend the potential recovery time of special status wildlife resources.

TABLE 4-77
CUMULATIVE IMPACTS ANALYSIS AREAS AND RATIONALE FOR SPECIAL STATUS SPECIES

Habitat Types	Cumulative Impacts Analysis Area (distance on either side of right-of-way) ¹	Rationale	Type and Source of Spatial Data
Birds			
Greater sage-grouse core areas or priority habitat Greater sage-grouse general habitat and transmission line corridors designated in Wyoming Executive Order 2011-5	11 miles	Sage-grouse that attend leks up to 18 kilometers (11 miles) from the Project may be indirectly affected by the loss of habitat functionality during other seasons of the year (Connolly et al. 2000).	Overall distribution (CPW 2012h); Lek locations (CPW 2012i; UDWR 2013b; WGFD 2012c); Core habitat areas (WGFD 2010b); Preliminary priority and preliminary general habitats (CPW 2012j); Occupied, winter, and brood rearing habitats (UDWR 2011b, c)
Mexican Spotted Owl Potential Habitat	1 mile	Human activities within 0.5 mile of nest sites may adversely affect nest success (Romin and Muck 2002). A 1.0-mile area around the potential right-of-way would encompass human activities within 0.5 mile of Mexican spotted owl nest sites that may be affected by the Project.	Modeled habitat in study corridors (EPG 2013)
Mountain Plover Potential Habitat	1,320 feet	Project disturbance buffers around active mountain plover nests vary with topography, type of activity proposed, and duration of disturbance. For disturbances including human presence and continual equipment operations a 0.25 mile (1,320 feet) buffer is recommended (BLM 2011w).	Modeled habitat in study corridors (EPG 2013)
Southwestern Willow Flycatcher Potential Habitat	1 mile	A 1.0-mile area around the potential right-of-way would encompass human activities within 0.5 mile of suitable riparian habitat for southwestern willow flycatcher that may be affected by the Project.	Modeled habitat in study corridors (EPG 2013)

TABLE 4-77
CUMULATIVE IMPACTS ANALYSIS AREAS AND RATIONALE FOR SPECIAL STATUS SPECIES

Habitat Types	Cumulative Impacts Analysis Area (distance on either side of right-of-way) ¹	Rationale	Type and Source of Spatial Data
Yellow-billed Cuckoo Potential Habitat	1,656 feet	Preferred yellow-billed cuckoo nesting sites are areas with at least 15 to 20 hectares (used 20 hectares) of deciduous/riparian forest (Wiggins 2005). A point buffered ² by 20 hectares (200,000 square meters) has a diameter of 1,656 feet.	Modeled habitat in study corridors (EPG 2013)
Mammals			
Black-footed Ferret Management Areas	1.3 miles	The minimal area required to sustain a ferret is 167 to 355 hectares (used 355) in white-tailed prairie dog habitat (4 prairie dogs per hectare) (Stromberg et al. 1983). A point buffered ² by 355 hectares (1.37 square miles) has a diameter of 1.3 miles.	Black footed-ferret management areas (BLM 2011g) (UDWR 2011d) Reintroduction sites (BLM 2011h; UDWR 2011d)
White-tailed Prairie Dog Potential Colonies	524 feet	Clark (1973) found that adult female white-tailed prairie dogs had the largest average home range size (1.9 hectares, rounded to 2 hectares), compared to juvenile females and males of all ages. A point buffered ² by 2 hectares (20,000 square meters) has a diameter of 524 feet.	Modeled colonies in study corridors (EPG 2013)
Pygmy Rabbit Potential Habitat	1.8 miles	Pygmy rabbits may disperse up to 1.8 miles from known burrow sites (Estes-Zumpf and Rachlow 2009).	Modeled habitat in study corridors (EPG 2013)
NOTE: ¹Cumulative impacts analysis areas were established for special status wildlife potential habitats based on available information regarding species specific home range or territory size. ²Home ranges/territories were assumed to be circular; cumulative impacts analysis areas include the 250-foot right-of-way for each alternative route and the adjacent potentially suitable habitat in a distance equal to one home range/territory diameter on either side of the right-of-way.			

4.3.8.1.4 Past, Present, and Other Reasonably Foreseeable Future Actions in the Special Status Wildlife Cumulative Impacts Analysis Areas

Land administered by Ashley, Manti-La Sal, and Uinta National Forests and the BLM in the Project area are managed for multiple-resource use. Past and present actions and RFFAs in the CIAAs, include timber harvest, livestock grazing, recreational use (e.g., off-road-vehicle use, biking, hiking, camping, and hunting), oil and gas exploration and development, mining, mineral production, transmission lines, pipelines, highways, wind and solar energy development, military training/testing, residential subdivision expansion, and communication site development. The combined actions contribute to incremental loss, alteration and fragmentation of foraging, nesting, breeding habitat and refuge and/or escape cover for special status wildlife species. These actions have contributed to modification of the landscape in the past will continue to contribute to this modification into the foreseeable future. Despite these incremental modifications of natural landscapes, the functionality of habitats that support special status wildlife species are maintained on the majority of USFS- and BLM-administered land and privately owned land. However, future actions will continue to adversely affect local special status wildlife populations as well as habitat functionality and quality in the CIAA for each species. Adverse impacts on special status wildlife could be particularly intense if development occurs in areas where specialized habitat types are limited (e.g., riparian corridors that support special status migratory birds or contiguous sagebrush habitats that support sage-grouse). Surrounding habitat may not provide the same limited and specialized habitat attributes and, therefore, is unlikely to accommodate displaced individuals whose limited specialized habitat areas would be affected (Watkins et al 2007). For a comprehensive summary of past, other present, and RFFAs refer to Tables 4-1 and 4-2.

In addition to RFFAs identified in Tables 4-1 and 4-2, BLM and USFS are currently preparing EISs to amend BLM RMPs and USFS LRMPs used to manage sage-grouse habitats in the Project area. All alternatives being considered in the BLM RMP and USFS LRMP amendment EISs would implement new conservation measures to protect sage-grouse habitat on BLM- and USFS-administered lands and would restrict the type and location of activities that could be authorized in sage-grouse habitat by the agencies. The amendment of these RMPs and LRMPs would benefit sage-grouse and sage-grouse habitat by protecting it from further degradation and promoting conservation actions. These management alternatives also would restrict some of the RFFAs proposed within sage-grouse habitat identified in Tables 4-1 and 4-2. This may result in a decrease in the amount of sage-grouse habitat affected cumulatively by all alternatives and other past, present and RFFAs (Tables 4-80 to 4-83, 4-91 through 4-93, and 4-101 through 4-103), though the amount of decrease cannot be calculated at this time.

Additionally, states and sage-grouse local working groups are currently revising sage-grouse management plans used to manage sage-grouse habitats in the Project area. Similar to the revision of BLM RMPs and USFS LRMPs, revisions to state and local working group sage-grouse management plans would likely result in more restrictive management of sage-grouse and sage-grouse habitat in the Project area. This may result in beneficial conservation actions being taken to improve sage-grouse habitats, increase sage-grouse habitat connectivity, and a decrease in the amount of sage-grouse habitat affected cumulatively by all alternatives and other past, present and RFFAs (Tables 4-80 to 4-83, 4-91 through 4-93, and 4-101 through 4-103), though the amount of decrease cannot be calculated at this time

4.3.8.2 Existing Condition

Conversion of native vegetation to agricultural use through vegetation clearance, deforestation and cultivation since European settlement and expansion began in the middle of the 19th century, has significantly affected the character of landscapes and the quantity and quality of habitats for special status wildlife resources in the CIAA for each species (Huston 2005). Construction of settlements, transportation systems, and increases in human population growth, the recreational industry (Leung et al. 2000) and energy development also have resulted in further conversion of habitats for special status

wildlife resources and significant shifts in the abundance, distribution, and species composition of the fauna and flora of the area. These historic modifications to the landscape have resulted in baseline conditions and trends to which the Project and other current, future and RFFAs (refer to Tables 4-1 and 4-2) analyzed in this section could contribute continuing and additive cumulative effects.

Incremental modification of the landscape and increased adverse impacts resulting from habitat loss and fragmentation on local special status wildlife habitats and their associated populations will continue as development of current and future projects occur. Energy generation and mineral exploration development continue to incrementally affect population dynamics, habitat quality, and availability for special status wildlife species in the CIAAs. Habitat fragmentation due to an increase in extent and frequency of human activity, land use changes, road and fencing density could increase the potential for species mortality, and alter and restrict large scale movement patterns and seasonal migrations (Andrén 1994; Franklin et al. 2002). Construction and use of new access roads also could affect the behavior, health, fitness and reproductive rates of special status wildlife through increased recreational activity, human presence/activity and noise in previously undisturbed habitat (Bowles 1998, Leung et al. 2000), although sensitivity to anthropogenic disturbance is likely to be species specific and vary among individuals within a species. As habitat loss and fragmentation steadily continue, additional loss and degradation of special status wildlife habitat quality and function due to range overlap with incrementally spreading energy generation and transmission development could occur and affect forage quality and carrying capacity for native special status species (Connelly et al. 2004). Livestock grazing could continue to potentially alternative plant assemblages and increase exotic grass introduction; potentially impacting fire regimes and habitat effectiveness.

4.3.8.3 Results

4.3.8.3.1 Qualitative Assessment of Cumulative Impacts on Special Status Wildlife Resources

Birds

For species for which agency or modeled data were not available, cumulative effects on some special status birds and their habitats likely to occur in the Project area could not be quantified although effects on these resources could occur as a result of impacts associated with the Project and past, other present, and RFFAs. Appendix E contains information including the current distribution, habitat requirements, and population trends for special status birds that may be affected by the Project. Similar to other resources described in Section 4.3.8.3, the current distribution and population trends for these species in the Project area are a result of the effects of past and present actions (Table 4-1) that have modified the landscape and affected the quality and quantity of resources necessary to maintain long-term sustainability of special status bird species in the Project area. The Project and other RFFAs would contribute to the ongoing and past modification of the landscape and effects on the quality and quantity of resources required by special status birds to maintain long-term species persistence in the Project area. The Project's contribution to these effects would be incremental and minor in comparison to the landscape-scale effects of past and other present actions and RFFAs (Tables 4-1 and 4-2). The habitats crossed by the alternative routes in each route grouping are similar and these habitats have been and will continue to be affected by similar past, other present, and RFFAs. Therefore, the effects on special status birds are anticipated to be similar in nature and extent among the alternative routes and the types of effects would be similar to those described for migratory birds included in Section 4.8.3.

Mammals

All alternative routes and route variations would contribute to the cumulative loss, fragmentation, and modification of special status mammal habitats resulting from the past and present actions and RFFAs in the CIAA (refer to Section 4.3.7.4). Appendix E contains information including the current distribution,

habitat requirements, and population trends for special status mammals that could be affected by the Project including species not analyzed in detail in this cumulative impacts analysis.

Reptiles

All alternative routes considered for the Project could contribute to cumulative impacts on special status reptiles (e.g., midget-faded rattle snake, Great Basin gopher snake, northern tree lizard). All Project alternative routes cumulatively could affect the availability of specialized habitats, the effectiveness of a given occupied habitat area at providing cover from predators, and open ‘inter-shrub’ space for movement and reduction in predator detection between refuge for special status reptiles (Newbold 2005, Stebbins 2003, Vitt 1994).

Appendix E contains information including the current distribution, habitat requirements, and population trends for special status reptiles that could be affected by the Project.

4.3.8.3.2 Synergistic Temporal Effects with Other Actions

Construction and site stabilization of the Project may follow, or could potentially overlap with construction and reclamation efforts for the TransWest Express Transmission Project. Synergistic temporal effects on disturbance and species recovery would be likely to occur. Prolonged interactive effects resulting from construction of these two projects would contribute to the overall cumulative effects on special status wildlife and their associated habitats. In addition, construction and site stabilization of the two projects (assuming 1,500 feet apart for the majority of the route) potentially could intensify short-term impacts on special status wildlife resources where the projects are colocated. Short-term cumulative impacts could include the incremental increase and prolonged human presence, and an increase in the length of time that special status wildlife are at risk of mortality from collision with construction equipment. Long-term cumulative impacts on special status wildlife, including loss and fragmentation of potential habitats, an increase in raptor perch sites and subsequent change in raptor species composition and a decrease in prey availability, and an increase in probability of raptor mortality due to collisions with transmission line towers or line, also could occur and be intensified where the projects are colocated. Some synergistic temporal effects resulting from construction of the projects, including repeated temporary displacement of special status wildlife from specialized and geographically limited habitats or the effects of multiple temporally overlapping actions that may displace individuals from specialized habitats from a larger geographic area, would be minimized or avoided through implementation of seasonal restrictions for both projects. For species that use specialized habitats year-round, some synergistic temporal effects resulting from construction projects may not be avoided.

4.3.8.3.3 Quantitative Assessment of Cumulative Impacts on Special Status Wildlife Resources

Quantitative analysis of cumulative effects on special status wildlife resources was completed through an inventory of available agency or modeled potential habitat (USFS 2013c) for each species and an estimation of the extent of development in these habitats associated with the Project, other present and past actions, and RFFAs. The extent of special status wildlife habitats (in acres) in the CIAA was determined using information provided by land-management agencies. The extent of development associated with the other present and past actions, and RFFAs was estimated using shapefiles of specific projects received from agencies and local governments. The extent of ground disturbance associated with the Project was estimated by alternative as described in Section 2.5.1.2.

Analysis of cumulative effects was performed for special status wildlife resources potentially affected for the Project. The results of this analysis for each special status wildlife resource analyzed qualitatively are described in this section. The estimated area of incremental Project development shown in the following tables indicates where Project development would occur outside of areas associated with past and other

present actions or RFFAs. Based on available data, quantitative analysis of cumulative impacts was conducted for the following special status wildlife resources:

- Southwestern willow flycatcher potential habitat
- Yellow-billed cuckoo potential habitat
- Mountain plover potential habitat
- Mexican spotted owl potential habitat
- Greater sage-grouse core area and priority habitat
- Greater sage-grouse general habitat
- Greater sage-grouse habitat within 4 miles of leks in core area and priority habitat
- Greater sage-grouse habitat within 4 miles of leks outside core area and priority habitat
- Pygmy rabbit potential habitat
- White-tailed prairie dog potential habitat
- Black-footed ferret management areas

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Southwestern Willow Flycatcher Potential Habitat

The WYCO alternative routes would have no direct or indirect impacts on potential southwestern willow flycatcher habitat. Thus, cumulative effects on this habitat are not analyzed.

Yellow-billed Cuckoo Potential Habitat

The estimated area of cumulative development in potential yellow-billed cuckoo habitat for WYCO alternative routes is summarized in Table 4-78.

TABLE 4-78 YELLOW-BILLED CUCKOO POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	43	4	4	0	8	35
WYCO-B-1	55	4	4	2	10	45
WYCO-B-2 (Agency Preferred Alternative)	43	4	4	0	8	35
WYCO-B-3	43	4	4	0	8	35
Alternative WYCO-C and Route Variations						
WYCO-C	43	4	4	0	8	35
WYCO-C-1	55	4	4	2	10	45
WYCO-C-2	43	4	4	0	8	35
WYCO-C-3	43	4	4	0	8	35
Alternative WYCO-D and Route Variation						
WYCO-D	377	42	5	14	61	316
WYCO-D-1	377	42	5	14	61	316

TABLE 4-78 YELLOW-BILLED CUCKOO POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-F and Route Variations						
WYCO-F	43	4	4	0	8	35
WYCO-F-1	55	4	4	2	10	45
WYCO-F-2	43	4	4	0	8	35
WYCO-F-3	43	4	4	0	8	35
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected yellow-billed cuckoo potential habitat in the CIAA include oil and gas development and wind-energy development. An RFFA in the CIAA for yellow-billed cuckoo includes construction of the TransWest Express Transmission Project.

The extent of development that would be associated with implementation of Alternative WYCO-D and Route Variation WYCO-D-1 and Route Variations WYCO-B-1, WYCO-C-1, and WYCO-F-1 would be anticipated to contribute incrementally to fragmentation and modification of the yellow-billed cuckoo potential habitat in the CIAA. For WYCO alternative routes, the extent of incremental Project development in yellow-billed cuckoo potential habitat accounts for a small proportion of total estimated cumulative development in the available potential habitat in the CIAA (Table 4-78).

If construction and site stabilization actions for the Project along the alignments of Alternative WYCO-D and Route Variation WYCO-D-1 and Route Variations WYCO-B-1, WYCO-C-1, and WYCO-F-1 overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of yellow-billed cuckoos from specialized and geographically limited contiguous riparian habitats or displacement of the species from a larger geographic area could be minimized or avoided through implementation of seasonal restrictions. For species that use specialized habitats year-round, synergistic temporal effects resulting from construction projects may not be avoided.

Mountain Plover Potential Habitat

The estimated area of cumulative development in potential mountain plover habitat for WYCO alternative routes is summarized in Table 4-79.

TABLE 4-79 MOUNTAIN PLOVER POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	17,422	1,156	1,012	752	2,920	14,501
WYCO-B-1	17,301	1,152	965	740	2,857	14,444
WYCO-B-2 (Agency Preferred Alternative)	17,328	1,161	991	745	2,897	14,431
WYCO-B-3	17,427	1,168	1,007	747	2,922	14,504
Alternative WYCO-C and Route Variations						
WYCO-C	19,722	2,280	1,759	689	4,729	14,993
WYCO-C-1	19,602	2,276	1,712	678	4,666	14,936
WYCO-C-2	19,629	2,285	1,738	683	4,706	14,923
WYCO-C-3	19,727	2,292	1,754	685	4,731	14,996
Alternative WYCO-D and Route Variation						
WYCO-D	12,064	1,339	1,126	398	2,862	9,202
WYCO-D-1	12,070	1,351	1,121	394	2,866	9,203
Alternative WYCO-F and Route Variations						
WYCO-F	21,662	1,249	1,795	838	3,882	17,779
WYCO-F-1	21,541	1,245	1,748	826	3,819	17,722
WYCO-F-2	21,568	1,254	1,774	831	3,859	17,709
WYCO-F-3	21,667	1,261	1,790	833	3,884	17,782
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected mountain plover potential habitat in the CIAA include fire management, coal and uranium mining, oil and gas development, and wind and other energy development. RFFAs in the CIAA for mountain plover include the construction of the Gateway West and TransWest Express transmission projects as well as coal mining, oil and gas development, and wind energy development. The extent of development associated with implementation of any of the WYCO alternative routes would be anticipated to contribute incrementally to fragmentation and modification of mountain plover potential habitat in the CIAA. However, mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to use habitats that are affected by the transmission line and ancillary facilities, access roads, temporary work areas, as well as adjacent mountain plover habitat. The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-79).

If construction and site stabilization actions for the Project along the alignments of the WYCO alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of mountain plover from specialized and contiguous brood-rearing habitats or displacement of the species from a larger geographic area could be minimized or avoided through implementation of seasonal restrictions.

Mexican Spotted Owl Potential Habitat

The WYCO alternative routes would have no direct or indirect impact on potential Mexican spotted owl habitat. Thus, cumulative effects on this habitat are not analyzed.

Greater Sage-grouse Designated Habitats

The types of potential effects on greater sage-grouse that could occur under WYCO alternative routes and the degree to which these effects would be avoided or mitigated are described in detail in Section 3.2.8.4. The estimated area of cumulative development in sage-grouse core areas or priority habitat, general habitat (including sage-grouse habitat in transmission line corridors designated in Wyoming Executive Order 2011-5), habitat within 4 miles of leks in core areas and priority habitat, and habitat within 4 miles of leks outside core areas and priority habitat for WYCO alternative routes is summarized in Tables 4-80 to 4-83.

TABLE 4-80 GREATER SAGE-GROUSE CORE AREAS OR PRIORITY HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	1,104,580	64,984	16,797	367	82,149	1,022,431
WYCO-B-1	1,107,701	65,238	16,797	367	82,402	1,025,299
WYCO-B-2 (Agency Preferred Alternative)	1,103,758	64,772	16,797	384	81,953	1,021,804
WYCO-B-3	1,104,186	64,868	16,797	367	82,032	1,022,154
Alternative WYCO-C and Route Variations						
WYCO-C	1,100,776	64,868	16,791	364	82,023	1,018,753
WYCO-C-1	1,103,898	65,122	16,791	365	82,277	1,021,621
WYCO-C-2	1,099,955	64,656	16,791	381	81,828	1,018,127
WYCO-C-3	1,100,383	64,752	16,791	364	81,907	1,018,476
Alternative WYCO-D and Route Variation						
WYCO-D	1,402,046	119,819	16,916	851	137,586	1,264,459
WYCO-D-1	1,401,652	119,702	16,916	853	137,472	1,264,180
Alternative WYCO-F and Route Variations						
WYCO-F	1,161,394	72,526	16,825	363	89,713	1,071,681
WYCO-F-1	1,164,516	72,779	16,825	363	89,967	1,074,549
WYCO-F-2	1,160,573	72,314	16,825	379	89,518	1,071,055
WYCO-F-3	1,161,000	72,410	16,825	363	89,597	1,071,404
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

TABLE 4-81 GREATER SAGE-GROUSE GENERAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	1,718,961	98,501	46,725	2,448	147,674	1,571,287
WYCO-B-1	1,718,890	98,500	46,725	2,462	147,688	1,571,202
WYCO-B-2 (Agency Preferred Alternative)	1,718,638	98,445	46,725	2,412	147,582	1,571,056
WYCO-B-3	1,718,787	98,479	46,725	2,398	147,602	1,571,185
Alternative WYCO-C and Route Variations						
WYCO-C	1,795,221	93,431	49,010	2,244	144,685	1,650,536
WYCO-C-1	1,795,150	93,430	49,010	2,260	144,699	1,650,452
WYCO-C-2	1,794,900	93,374	49,010	2,210	144,593	1,650,307
WYCO-C-3	1,795,047	93,408	49,010	2,195	144,613	1,650,434
Alternative WYCO-D and Route Variation						
WYCO-D	1,729,865	152,224	38,667	1,755	192,646	1,537,219
WYCO-D-1	1,729,690	152,202	38,667	1,711	192,579	1,537,110
Alternative WYCO-F and Route Variations						
WYCO-F	1,828,143	119,332	48,356	2,484	170,173	1,657,970
WYCO-F-1	1,828,069	119,331	48,356	2,499	170,187	1,657,882
WYCO-F-2	1,827,820	119,276	48,356	2,449	170,082	1,657,738
WYCO-F-3	1,827,966	119,310	48,356	2,435	170,101	1,657,865
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

TABLE 4-82 GREATER SAGE-GROUSE HABITAT WITHIN 4 MILES OF LEKS IN CORE AREAS OR PRIORITY HABITATS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	1,299,410	75,337	21,317	756	97,410	1,202,000
WYCO-B-1	1,302,462	75,590	21.317	756	97,662	1,204,799
WYCO-B-2 (Agency Preferred Alternative)	1,298,266	75,069	21.317	760	97,146	1,201,120
WYCO-B-3	1,298,841	75,199	21.317	749	97,264	1,201,577

TABLE 4-82 GREATER SAGE-GROUSE HABITAT WITHIN 4 MILES OF LEKS IN CORE AREAS OR PRIORITY HABITATS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-C and Route Variations						
WYCO-C	1,291,792	74,010	21,235	750	95,996	1,195,796
WYCO-C-1	1,294,844	74,263	21,235	751	96,248	1,198,596
WYCO-C-2	1,290,649	73,742	21,235	755	95,732	1,194,917
WYCO-C-3	1,291,223	73,872	21,235	743	95,850	1,195,374
Alternative WYCO-D and Route Variation						
WYCO-D	1,367,040	143,356	21,350	1,146	165,852	1,471,187
WYCO-D-1	1,636,471	143,217	21,350	1,142	165,709	1,470,762
Alternative WYCO-F and Route Variations						
WYCO-F	1,385,423	86,078	21,414	747	108,240	1,277,183
WYCO-F-1	1,388,475	86,331	21,414	748	108,492	1,279,983
WYCO-F-2	1,384,280	85,810	21,414	752	107,976	1,276,304
WYCO-F-3	1,384,854	85,940	21,414	740	108,094	1,276,760
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

TABLE 4-83 GREATER SAGE-GROUSE HABITAT WITHIN 4 MILES OF LEKS OUTSIDE CORE AREAS OR PRIORITY HABITATS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	991,619	56,312	29,102	801	86,215	905,404
WYCO-B-1	991,620	56,312	29,102	797	86,212	905,408
WYCO-B-2 (Agency Preferred Alternative)	991,619	56,312	29,102	798	86,212	905,407
WYCO-B-3	991,620	56,312	29,102	800	86,214	905,406
Alternative WYCO-C and Route Variations						
WYCO-C	998,698	50,122	29,075	763	79,960	908,739
WYCO-C-1	998,698	50,122	29,075	760	79,956	908,742
WYCO-C-2	998,698	50,122	29,075	760	79,957	908,741
WYCO-C-3	998,698	50,122	29,075	762	79,959	908,739
Alternative WYCO-D and Route Variation						
WYCO-D	1,126,544	102,941	25,828	919	129,688	996,856
WYCO-D-1	1,126,544	102,941	25,828	921	129,690	996,854

TABLE 4-83 GREATER SAGE-GROUSE HABITAT WITHIN 4 MILES OF LEKS OUTSIDE CORE AREAS OR PRIORITY HABITATS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-F and Route Variations						
WYCO-F	1,094,756	72,401	30,625	978	104,004	990,752
WYCO-F-1	1,094,756	72,401	30,625	974	104,000	990,755
WYCO-F-2	1,094,756	72,401	30,625	975	104,001	990,755
WYCO-F-3	1,094,756	72,401	30,625	977	104,004	990,752
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected sage-grouse designated habitats in the CIAA include fire management, coal mining, oil and gas development, and wind and other energy development. RFFAs in the CIAA for designated sage-grouse habitats include the construction of the Gateway West and TransWest Express transmission projects as well as coal mining, oil and gas development, and wind energy development. The extent of development associated with implementation of any of the WYCO alternative routes would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse designated habitats in the CIAA (Tables 4-80 to 4-83).

Some Project impacts on sage-grouse associated with WYCO alternative routes in Wyoming would occur in corridors designated by Wyoming Executive Order 2011-005 or in areas where an alternative route considered for the Project is parallel to an existing EHV transmission line or other linear developments that have degraded the existing quality of sage-grouse habitats (e.g., I-80). In Wyoming, the majority of the core areas and priority habitat, as well as habitats within 4 miles of leks in core areas and priority habitats are avoided by the WYCO alternative routes where there are no past or other present actions or RFFAs so as to not contribute to the cumulative fragmentation and modification of these sage-grouse habitats with high conservation value. The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Tables 4-80 through 4-83).

However, some Project impacts on general sage-grouse habitats and habitats within 4 miles of leks outside of core areas and priority habitats in Wyoming would occur in areas anticipated to be unaffected by past and other present actions and RFFAs. Thus, the Project would be anticipated to incrementally contribute to cumulative developments in these sage-grouse habitats outside of core and priority areas. Much of the impacts on sage-grouse associated with WYCO alternative routes in Colorado would be anticipated to occur outside of existing utility corridors and in areas that have not been substantially altered by previous anthropogenic development activities. In Colorado, development of any of the WYCO alternative routes would further contribute to the fragmentation modification of sage-grouse core areas and priority habitats, habitats within 4 miles of leks in core areas and priority habitats, general habitats, and habitats within 4 miles of leks outside of core areas and priority habitats in the CIAA.

Past and present actions, including oil and gas development, have occurred throughout much of the south-central Wyoming portion of the Project area. The WYCO alternative routes would be located adjacent to existing disturbances including oil and gas development, interstate highways, transmission lines, and unpaved roads in some areas of Wyoming. However, in some areas of Wyoming, alternative routes could cross habitats that have been largely unaffected by previous anthropogenic development, where the route would be located in the transmission corridor designated by Wyoming Executive Order 2011-5, and in the vicinity of Flat Top Mountain between I-80 and the Wyoming/Colorado state line. In Colorado, the

WYCO alternative routes also would be located in areas largely unaffected by previous anthropogenic development between the Wyoming/Colorado state line and U.S. Highway 40. Alternative routes would be parallel to existing infrastructure including a high-voltage transmission line from the junction with U.S. Highway 40 to the end of the alternative routes in Colorado.

If greater sage-grouse are observed during preconstruction surveys for the Project, selective mitigation measures, including seasonal and spatial avoidance would be implemented to reduce potential effects. However, cumulative impacts on vegetation structure providing contiguous sagebrush communities in greater sage-grouse habitat could occur.

If construction and site stabilization actions for the Project along the alignments of the WYCO alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of sage-grouse from geographically limited contiguous sagebrush habitats or displacement of the species from a larger geographic area could be minimized or avoided through implementation of seasonal restrictions.

Pygmy Rabbit Potential Habitat

The estimated area of cumulative development in potential pygmy rabbit habitat for WYCO alternative routes is summarized in Table 4-84.

TABLE 4-84 PYGMY RABBIT POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	216,563	11,844	11,104	1,307	24,255	192,308
WYCO-B-1	217,263	11,701	11,104	1,321	24,126	193,136
WYCO-B-2 (Agency Preferred Alternative)	216,563	11,844	11,104	1,302	24,250	192,313
WYCO-B-3	216,563	11,844	11,104	1,306	24,254	192,309
Alternative WYCO-C and Route Variations						
WYCO-C	213,107	12,146	11,042	1,229	24,416	188,691
WYCO-C-1	213,806	12,002	11,042	1,244	24,288	189,518
WYCO-C-2	213,107	12,146	11,042	1,225	24,412	188,695
WYCO-C-3	213,107	12,146	11,042	1,228	24,415	188,692
Alternative WYCO-D and Route Variation						
WYCO-D	242,937	16,806	13,445	1,276	31,527	211,410
WYCO-D-1	242,937	16,806	13,445	1,279	31,529	211,408

TABLE 4-84 PYGMY RABBIT POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-F and Route Variations						
WYCO-F	253,773	13,328	12,853	1,480	27,661	226,112
WYCO-F-1	254,473	13,185	12,853	1,494	27,532	226,941
WYCO-F-2	253,773	13,328	12,853	1,475	27,656	226,117
WYCO-F-3	253,773	13,328	12,853	1,479	27,660	226,113
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected pygmy rabbit potential habitats in the CIAA include fire management, coal and uranium mining, oil and gas development, and wind and other energy development. RFFAs in the CIAA for pygmy rabbit include the construction of the Gateway West and TransWest Express transmission projects as well as coal mining, oil and gas development, and wind energy development. The extent of development associated with implementation of the WYCO alternative routes would be anticipated to contribute incrementally to loss, fragmentation and modification of pygmy rabbit potential habitat in the CIAA. Pygmy rabbit habitat adjacent to existing human development and linear infrastructure is likely to have previously incurred some of the effects described in Section 3.2.8.4. The magnitude of effects of WYCO alternative routes on pygmy rabbit habitat may be reduced, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure. The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-84).

White-tailed Prairie Dog Potential Habitat

The estimated area of cumulative development in potential white-tailed prairie dog habitat for WYCO alternative routes is summarized in Table 4-85.

TABLE 4-85 WHITE-TAILED PRAIRIE DOG POTENTIAL COLONIES CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Colonies	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Colonies
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	2,639	121	131	245	498	2,141
WYCO-B-1	2,434	111	70	234	415	2,018
WYCO-B-2 (Agency Preferred Alternative)	2,433	115	88	232	434	1,999
WYCO-B-3	2,575	115	120	239	474	2,101

TABLE 4-85 WHITE-TAILED PRAIRIE DOG POTENTIAL COLONIES CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Colonies	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Colonies
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-C and Route Variations						
WYCO-C	2,922	455	254	195	903	2,019
WYCO-C-1	2,717	445	193	184	821	1,896
WYCO-C-2	2,717	448	210	182	840	1,877
WYCO-C-3	2,858	449	243	188	880	1,979
Alternative WYCO-D and Route Variation						
WYCO-D	2,296	316	209	164	689	1,608
WYCO-D-1	2,232	310	198	158	666	1,566
Alternative WYCO-F and Route Variations						
WYCO-F	2,722	137	217	231	585	2,136
WYCO-F-1	2,517	127	156	221	504	2,013
WYCO-F-2	2,516	131	174	218	523	1,994
WYCO-F-3	2,658	131	206	225	562	2,096
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected white-tailed prairie dog potential colonies in the CIAA include fire management, oil and gas development, and wind-energy development. RFFAs in the CIAA for white-tailed prairie dog include the construction of the Gateway West and TransWest Express transmission projects as well as oil and gas development, and wind-energy development. The extent of development associated with implementation of any of the WYCO alternative routes would be anticipated to incrementally contribute to fragmentation and modification of white-tailed prairie dog potential colonies in the CIAA. Potential white-tailed prairie dog colonies adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4. The magnitude of development associated with implantation of WYCO alternative routes on potential white-tailed prairie dog colonies could be reduced, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure.

The majority of total available potential colonies for this species would not be developed by the Project or other cumulative actions (Table 4-85).

Black-footed Ferret Potential Habitat

The estimated area of cumulative development in black-footed ferret management areas for WYCO alternative routes is summarized in Table 4-86.

TABLE 4-86 BLACK-FOOTED FERRET MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	34,036	4,409	861	273	5,543	28,493
WYCO-B-1	34,036	4,409	861	272	5,542	28,494
WYCO-B-2 (Agency Preferred Alternative)	34,036	4,409	861	272	5,542	28,494
WYCO-B-3	34,036	4,409	861	273	5,543	28,493
Alternative WYCO-C and Route Variations						
WYCO-C	34,036	4,409	861	271	5,541	28,495
WYCO-C-1	34,036	4,409	861	270	5,540	28,496
WYCO-C-2	34,036	4,409	861	270	5,540	28,496
WYCO-C-3	34,036	4,409	861	271	5,541	28,495
Alternative WYCO-D and Route Variation						
WYCO-D	36,322	6,615	3,454	237	10,306	26,017
WYCO-D-1	36,322	6,615	3,454	237	10,306	26,016
Alternative WYCO-F and Route Variations						
WYCO-F	34,036	4,409	861	270	5,540	28,496
WYCO-F-1	34,036	4,409	861	269	5,539	28,497
WYCO-F-2	34,036	4,409	861	269	5,539	28,497
WYCO-F-3	34,036	4,409	861	270	5,540	28,496
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected black-footed ferret management areas in the CIAA include fire management, coal mining, oil and gas development, and wind-energy development. RFFAs in the CIAA for black-footed ferret include the construction of the TransWest Express Transmission Project and coal mining. The extent of development associated with implementation of the WYCO alternative routes would be anticipated to contribute incrementally to fragmentation and modification of black-footed ferret potential habitat in the CIAA. The potential Project effects on black-footed ferret that could occur under the WYCO alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.8.4.

WYCO alternative routes would intersect the Shirley Basin black-footed ferret management area (MV-9a). Habitats that would be crossed in the management area are characteristically rugged terrain and are not known to support prairie dogs, which are the primary prey of black-footed ferrets. Due to the presumed lack of prairie dog towns, the area affected by WYCO alternative routes would be unlikely to support black-footed ferrets at this time or in the future.

WYCO alternative routes also would intersect the Wolf Creek black-footed ferret management area. Black footed-ferret occurrences have not been recorded since a 2009 to 2010 plague affected the Wolf Creek ferret population, ferrets have not been located during the last 2 years, and reintroductions are not

currently taking place (Ausmus 2012). However, if black-footed ferret reintroductions are resumed in the future, construction and operation of the WYCO alternative routes could result in effects described in Section 3.2.8.4.

The majority of total available potential habitat for this species would not be affected by the Project or other cumulative actions (Table 4-86).

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Southwestern Willow Flycatcher Potential Habitat

The estimated area of cumulative development in potential southwestern willow flycatcher habitat for COUT BAX alternative routes is summarized in Table 4-87.

TABLE 4-87 SOUTHWESTERN WILLOW FLYCATCHER POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	884	105	5	2	111	773
COUT BAX-C	832	102	19	1	122	710
COUT BAX-E	1,742	93	608	6	708	1,034
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected southwestern willow flycatcher potential habitats in the CIAA include coal and mineral mining, oil and gas development, and pipeline corridors. RFFAs in the CIAA for southwestern willow flycatcher include the construction of the TransWest Express Transmission Project and industrial development. The extent of development that would be associated with implementation of the COUT BAX alternative routes would be anticipated to occur primarily in areas affected past, present or RFFAs in the southwestern willow flycatcher CIAA along COUT BAX alternative routes. The vast majority of the Project development of these alternative routes would not be anticipated to contribute to fragmentation and modification of southwestern willow flycatcher potential habitat in the CIAA. For all alternative routes, the extent of incremental Project development in southwestern willow flycatcher potential habitat accounts for a small proportion of total estimated cumulative development in the available potential habitat in the CIAA (Table 4-87). If construction and site stabilization actions for the Project along the alignments of the COUT BAX alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of southwestern willow flycatcher from specialized and geographically limited contiguous riparian habitats or displacement of the species from a larger geographic area could be minimized or avoided through implementation of seasonal restrictions. For species that use specialized habitats year-round, synergistic temporal effects resulting from construction projects may not be avoided.

Yellow-billed Cuckoo

The estimated area of cumulative development in potential yellow-billed cuckoo habitat for COUT BAX alternative routes is summarized in Table 4-88.

TABLE 4-88 YELLOW-BILLED CUCKOO POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	462	133	7	4	144	317
COUT BAX-C	484	154	8	3	165	319
COUT BAX-E	686	147	115	10	272	415
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected yellow-billed cuckoo potential habitats in the CIAA include fire management, coal and mineral mining, oil and gas development, and pipeline corridors. RFFAs in the CIAA for yellow-billed cuckoo include the construction of the TransWest Express Transmission Project and industrial development. The extent of development that would be associated with implementation of the COUT BAX alternative routes would be anticipated to occur primarily in areas affected by past, present or RFFAs in the yellow-billed cuckoo CIAA along COUT BAX alternative routes. The vast majority of the Project development of these alternative routes would not contribute to fragmentation and modification of yellow-billed cuckoo potential habitat in the CIAA. For COUT BAX alternative routes, the extent of incremental Project development in yellow-billed cuckoo potential habitat accounts for a small proportion of total estimated cumulative development in the available potential habitat in the CIAA (Table 4-88).

If construction and site stabilization actions for the Project along the alignments of the COUT BAX alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of yellow-billed cuckoo from specialized and geographically limited contiguous riparian habitats or displacement of the species from a larger geographic area could be minimized or avoided through implementation of seasonal restrictions. For species that use specialized habitats year-round, synergistic temporal effects resulting from construction projects may not be avoided.

Mountain Plover

The estimated area of cumulative development in potential mountain plover habitat for COUT BAX alternative routes is summarized in Table 4-89.

TABLE 4-89 MOUNTAIN PLOVER POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	366	36	21	14	72	295
COUT BAX-C	366	36	21	14	71	295
COUT BAX-E	366	36	21	13	71	295
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected mountain plover potential habitats in the CIAA include fire management, coal and mineral mining, oil and gas development, and pipeline corridors. RFFAs in the CIAA for mountain plover include the construction of the TransWest Express Transmission Project and industrial development. The extent of the development associated with implementation of the COUT BAX alternative routes would be anticipated to contribute incrementally to fragmentation modification of mountain plover habitat in the CIAA. However, mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to use habitats that are affected by the transmission line and ancillary facilities, access roads, temporary work areas, as well as adjacent mountain plover habitat. The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-89).

If construction and site stabilization actions for the Project along the alignments of the COUT BAX alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of mountain plover from specialized and contiguous brood-rearing habitats or displacement of the species from a larger geographic area could be minimized or avoided through implementation of seasonal restrictions.

Mexican Spotted Owl

The estimated area of cumulative development in potential Mexican spotted owl habitat for COUT BAX alternative routes is summarized in Table 4-90.

TABLE 4-90 MEXICAN SPOTTED OWL POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	26,171	738	336	233	1,307	24,864
COUT BAX-C	28,483	742	401	222	1,365	27,118
COUT BAX-E	24,815	731	289	215	1,235	23,580
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected Mexican spotted owl potential habitats in the CIAA include fire management, oil and gas development, and pipeline corridors. The RFFA in the CIAA for Mexican spotted owl includes the construction of the TransWest Express Transmission Project. The extent of development associated with implementation of any of the COUT BAX alternative routes would be anticipated to contribute incrementally to fragmentation and modification of Mexican spotted owl potential habitat in the CIAA. If Mexican spotted owls are detected during preconstruction surveys, selective mitigation measures, including seasonal and spatial avoidance would be implemented to reduce potential effects. However, some vegetation structure in potential Mexican spotted owl nesting habitat could be lost, as a result of clearing of trees to maintain a safe conductor height.

If construction and site stabilization actions for the Project along the alignments of the COUT BAX alternative routes overlapped temporally with the development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of Mexican spotted owl from specialized and geographically limited nesting habitats or displacement of the species from a larger geographic area could be minimized or avoided through implementation of seasonal restrictions.

Greater Sage-grouse

The types of potential effects on greater sage-grouse that could occur under COUT BAX alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.8.4. The estimated area of cumulative development in sage-grouse core areas or priority habitat, general habitat (including sage-grouse habitat in transmission line corridors designated in Wyoming Executive Order 2011-5), habitat within 4 miles of leks in core areas or priority habitat, and habitat within 4 miles of leks outside core areas and priority habitat for COUT BAX alternative routes is summarized in Tables 4-91 through 4-93.

TABLE 4-91 GREATER SAGE-GROUSE CORE AREAS OR PRIORITY HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	201,283	50,170	9,951	45	60,166	141,117
COUT BAX-C	201,283	50,170	9,951	44	60,165	141,118
COUT BAX-E	263,633	45,979	17,626	36	63,641	199,992
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

TABLE 4-92 GREATER SAGE-GROUSE GENERAL HABITAT AND TRANSMISSION LINE CORRIDORS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	137,697	17,877	871	192	18,939	118,757
COUT BAX-C	137,697	17,877	871	188	18,936	118,761
COUT BAX-E	137,697	17,877	871	183	18,930	118,766
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

TABLE 4-93 GREATER SAGE-GROUSE HABITAT WITHIN 4 MILES OF LEKS IN CORE AREAS AND PRIORITY HABITATS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	56,598	1,864	8,220	0	10,085	46,513
COUT BAX-C	56,598	1,864	8,220	0	10,085	46,513
COUT BAX-E	67,177	1,552	8,226	0	9,778	57,398
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected sage-grouse designated habitats in the CIAA include fire management, coal and mineral mining, oil and gas development, pipeline corridors, and communication development. RFFAs in the CIAA for designated sage-grouse habitats include the construction of the TransWest Express Transmission Project as well as coal mining, oil and gas development, wind-energy, and reservoir development. The extent of development associated with implementation of any of the COUT BAX alternative routes would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse designated habitats in the CIAA.

Some Project impacts on sage-grouse associated with COUT BAX alternative routes in Colorado would be in mapped general habitat and would not occur within 4 miles of known leks. Additionally, much of the development of the COUT BAX alternative routes in Colorado would be parallel to existing disturbances, including high-traffic unpaved roads and existing oil and gas development in areas where general sage-grouse habitat would be intersected. Much of the impacts on sage-grouse associated with COUT BAX alternative routes in Utah would be in mapped habitat and would not occur within 4 miles of known leks. Additionally, much of the development of the COUT BAX alternative routes in Utah would be parallel to an existing EHV transmission line. However, sage-grouse habitats in the CIAA of the different COUT BAX alternative routes have different attributes including population size, levels of lek attendance, stability, and connectivity to surrounding suitable habitats. Detailed descriptions of greater sage-grouse populations crossed by COUT BAX alternative routes in Utah are located in Section 3.2.8. The magnitude of cumulative development in sage-grouse core areas or priority habitat for all alternative routes by sage-grouse population is summarized in Table 4-93.

COUT BAX alternative routes would not intersect sage-grouse habitats within 4 miles of known leks, which are presumably the most important areas for maintaining statewide sage-grouse lek populations in Colorado and Utah. If greater sage-grouse are observed during preconstruction surveys for the Project, selective mitigation measures, including seasonal and spatial avoidance would be implemented to reduce potential effects. However, cumulative impacts on some vegetation structure providing contiguous sagebrush communities in greater sage-grouse habitat could occur.

If construction and site stabilization actions for the Project along the alignments of the COUT BAX alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of sage-grouse from geographically limited contiguous sagebrush habitats or displacement of the species from a larger geographic area could be minimized or avoided through implementation of seasonal restrictions.

Greater Sage-grouse Utah Populations Crossed by COUT BAX Alternative Routes

Detailed descriptions of greater sage-grouse populations crossed by COUT BAX alternative routes in Utah are located in Section 3.2.8. The estimated area of cumulative disturbance to sage-grouse core areas or priority habitats for all alternative routes by sage-grouse population is summarized in Table 4-94.

TABLE 4-94 SAGE-GROUSE UTAH POPULATIONS (CORE AREAS OR PRIORITY HABITAT) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Horn Mountain						
COUT BAX-B	49,000	13,761	80	39	13,881	35,119
COUT BAX-C	49,000	13,761	80	39	13,880	35,120
COUT BAX-E	3,594	3,003	0	0	3,003	590
Emma Park						
COUT BAX-B	0	0	0	0	0	0
COUT BAX-C	0	0	0	0	0	0
COUT BAX-E	54,374	3,082	7,116	0	10,197	44,177
Deadman's Bench						
COUT BAX-B	11,627	1,017	266	0	1,283	10,343
COUT BAX-C	11,627	1,017	266	0	1,283	10,343
COUT BAX-E	11,627	1,017	266	0	1,283	10,343
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-4) in the CIAA for the species, only habitats supporting the Horn Mountain Population are affected directly by the COUT BAX alternative routes. Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Horn Mountain population in the CIAA include fire management, coal mining, and oil and gas development. The RFFA in the CIAA for sage-grouse core areas and priority habitats includes the construction of the TransWest Express Transmission Project. The extent of development associated with implementation of Alternatives COUT BAX-B and COUT BAX-C would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse core areas and priority habitats in the CIAA (Table 4-94). Some of the Project impacts on sage-grouse habitat supporting the Horn Mountain population associated with Alternatives COUT BAX-B and COUT BAX-C in Utah would be in mapped priority and core area habitat (as all occupied sage-grouse habitat is considered priority habitat) and would not occur within 4 miles of known leks. Additionally, much of the development of Alternatives COUT BAX-B and COUT BAX-C, where they cross the Horn Mountain area, would be parallel to an existing EHV transmission line. The majority of the total available sage-grouse core area and priority habitat supporting the Horn Mountain population would not be developed by the Project or other cumulative actions (Table 4-94).

The COUT BAX alternative routes would not intersect sage-grouse habitats within 4 miles of known leks supporting the Horn Mountain population. Presumably habitats within 4 miles of leks are the most important areas for maintaining statewide sage-grouse lek populations in Utah. Results of research projects in Colorado, Idaho, and Wyoming have indicated that approximately 80 percent of sage-grouse nests occur within 4 miles of the active lek where female grouse were captured and assumed to have bred (Colorado Greater Sage-grouse Steering Committee 2008).

Alternative COUT BAX-E crosses four habitat areas historically considered to be part of the Emma Park population, however, as sage-grouse presence has not been recently confirmed (BLM 2013b), these habitat areas were not considered for the analysis of potential impacts on this population.

White-tailed Prairie Dog Colonies

The estimated area of cumulative development in potential white-tailed prairie dog colonies for COUT BAX alternative routes is summarized in Table 4-95.

TABLE 4-95 WHITE-TAILED PRAIRIE DOG POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	1,671	39	231	85	355	1,315
COUT BAX-C	1,863	31	283	72	386	1,477
COUT BAX-E	1,384	110	209	104	424	961
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected white-tailed prairie dog potential colonies in the CIAA include fire management, coal and mineral mining, oil and gas development, and pipeline corridors. The primary RFFA in the CIAA for white-tailed prairie dog is the construction of the TransWest Express Transmission Project. The extent of development associated with implementation of any of the COUT BAX alternative routes would be anticipated to incrementally contribute to fragmentation and modification of white-tailed prairie dog potential colonies in the CIAA. Potential white-tailed prairie dog colonies adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4. The magnitude of effects of COUT BAX alternative routes on potential white-tailed prairie dog colonies may be reduced, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure.

The majority of total available potential colonies for this species would not be developed by the Project or other cumulative actions (Table 4-95).

Black-footed Ferret

The estimated area of cumulative development in black-footed ferret management areas for COUT BAX alternative routes is summarized in Table 4-96.

TABLE 4-96 BLACK-FOOTED FERRET MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	3,153	138	123	25	285	2,868
COUT BAX-C	3,153	138	123	24	285	2,868
COUT BAX-E	3,153	138	123	24	284	2,869
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions CIAA that have affected black-footed ferret management areas in the CIAA includes fire management. The RFFA in the CIAA for black-footed ferret includes the construction of the TransWest Express Transmission Project. The extent of development associated with implementation of the COUT BAX alternative routes would be anticipated to contribute incrementally to fragmentation and modification of black-footed ferret potential habitat in the CIAA. The potential Project effects on black-footed ferret that could occur under the COUT BAX alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.8.4. COUT BAX alternative routes would intersect the Wolf Creek black-footed ferret management area. Black footed-ferret occurrences have not been recorded since a 2009/2010 plague affected the Wolf Creek ferret population, ferrets have not been located in the last 2 years, and reintroductions are not currently taking place (Ausmus 2012). However, if black-footed ferret reintroductions are resumed in the future, the COUT BAX alternative routes could result in effects described in Section 3.2.8.4.

The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-96).

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Southwestern Willow Flycatcher

The estimated area of cumulative development in potential southwestern willow flycatcher habitat for COUT alternative routes is summarized in Table 4-97.

TABLE 4-97 SOUTHWESTERN WILLOW FLYCATCHER POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternatives COUT-H and I						
COUT-H (Applicant Preferred Alternative)	10	10	0	0	10	0
COUT-I	197	42	7	1	51	147
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions in the CIAA that have affected southwestern willow flycatcher potential habitats in the CIAA include oil and gas development. The RFFA in the CIAA for southwestern willow flycatcher includes the construction of the TransWest Express Transmission Project. The extent of development that would be associated with implementation of Alternative COUT-I would not be anticipated to contribute to fragmentation and modification of southwestern willow flycatcher potential habitat in the CIAA. For COUT alternative routes, the extent of incremental Project development in southwestern willow flycatcher potential habitat accounts for a small proportion of total estimated cumulative development in the available potential habitat in the CIAA (Table 4-97). If construction and site stabilization actions for the Project along the alignment of Alternative COUT-I overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of southwestern willow flycatcher from specialized and geographically limited contiguous riparian habitats or displacement of the species from a larger geographic area could be minimized or avoided through

implementation of seasonal restrictions. For species that use specialized habitats year-round, synergistic temporal effects resulting from construction projects may not be avoided.

Yellow-billed Cuckoo

The magnitude of cumulative development in potential yellow-billed cuckoo habitat for COUT alternative routes is summarized in Table 4-98.

TABLE 4-98 YELLOW-BILLED CUCKOO POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	1,225	605	29	20	654	570
COUT-A-1	1,225	605	29	20	654	570
Alternative COUT-B and Route Variations						
COUT-B	1,263	302	69	10	381	883
COUT-B-1	1,212	298	64	11	372	840
COUT-B-2	1,212	298	64	11	372	840
COUT-B-3	1,212	298	64	11	372	840
COUT-B-4	1,212	298	64	11	372	840
COUT-B-5	1,212	298	64	11	373	840
Alternative COUT-C and Route Variations						
COUT-C	525	173	21	5	199	326
COUT-C-1	474	169	16	6	191	283
COUT-C-2	474	169	16	6	191	283
COUT-C-3 (Agency Preferred Alternative)	474	169	16	6	191	283
COUT-C-4	474	169	16	6	191	283
COUT-C-5	474	169	16	6	191	283
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	344	135	14	4	152	192
COUT-I	337	133	12	5	149	187
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions in the CIAA that have affected yellow-billed cuckoo potential habitats in the CIAA include oil and gas development. The RFFA in the CIAA for yellow-billed cuckoo includes the construction of the TransWest Express Transmission Project and the Victory Pipeline Project. The extent of development that would be associated with implementation of the COUT routes would be anticipated to contribute incrementally to fragmentation and modification of yellow-billed cuckoo potential habitat in the CIAA. For COUT alternative routes, the extent of incremental Project development in yellow-billed cuckoo potential habitat accounts for a small proportion of total estimated cumulative development in the available potential habitat in the CIAA (Table 4-98). If construction and site stabilization actions for the

Project along the alignments of the COUT alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of yellow-billed cuckoo from specialized and geographically limited contiguous riparian habitats or displacement of the species from a larger geographic area could be minimized or avoided through implementation of seasonal restrictions. For species that use specialized habitats year-round, synergistic temporal effects resulting from construction projects may not be avoided.

Mountain Plover

The estimated area of cumulative development in potential mountain plover habitat for COUT alternative routes is summarized in Table 4-99.

TABLE 4-99 MOUNTAIN PLOVER POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Routes	Total Available Potential Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Potential Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	6,093	528	309	195	1,032	5,062
COUT-A-1	6,093	528	309	195	1,032	5,062
Alternative COUT-B and Route Variations						
COUT-B	7,213	658	438	179	1,275	5,939
COUT-B-1	7,213	658	438	180	1,276	5,937
COUT-B-2	7,213	658	438	180	1,276	5,938
COUT-B-3	7,213	658	438	180	1,275	5,938
COUT-B-4	7,213	658	438	180	1,275	5,938
COUT-B-5	7,213	658	438	184	1,280	5,933
Alternative COUT-C and Route Variations						
COUT-C	10,409	2,947	398	304	3,649	6,760
COUT-C-1	10,409	2,947	398	307	3,652	6,757
COUT-C-2	10,409	2,947	398	306	3,651	6,758
COUT-C-3 (Agency Preferred Alternative)	10,409	2,947	398	309	3,654	6,755
COUT-C-4	10,409	2,947	398	309	3,654	6,755
COUT-C-5	10,409	2,947	398	299	3,644	6,765
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	10,409	2,947	398	293	3,637	6,772
COUT-I	10,409	2,947	398	288	3,633	6,776
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions in the CIAA that have affected mountain plover potential habitats in the CIAA include fire management, coal and other mineral mining, oil and gas development, pipeline corridors, and residential and industrial development. RFFAs in the CIAA for mountain plover include the construction of the TransWest Express Transmission Project, the Victory Pipeline Project, and oil and gas

development. The extent of development associated with implementation of other COUT alternative routes would be anticipated to contribute incrementally to fragmentation and modification of mountain plover potential habitat in the CIAA. However, mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to use habitats that are affected by the transmission line and ancillary facilities, access roads, temporary work areas, as well as adjacent mountain plover habitat. The majority of the total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-99).

If construction and site stabilization actions for the Project along the alignments of the COUT alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, of the projects including displacement of mountain plover from specialized and contiguous brood-rearing habitats or displacement of the species from a larger geographic area could be minimized or avoided through implementation of seasonal restrictions.

Mexican Spotted Owl

The estimated area of cumulative development in potential Mexican spotted owl habitat for COUT alternative routes is summarized in Table 4-100.

TABLE 4-100 MEXICAN SPOTTED OWL POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-B and Route Variations						
COUT-B	12,346	3,613	354	0	3,967	8,379
COUT-B-1	9,637	3,584	264	8	3,856	5,781
COUT-B-2	10,843	3,602	329	0	3,930	6,913
COUT-B-3	12,226	3,613	354	19	3,986	8,240
COUT-B-4	12,226	3,613	354	19	3,986	8,240
COUT-B-5	10,843	3,602	329	0	3,930	6,913
Alternative COUT-C and Route Variations						
COUT-C	12,497	217	204	81	502	11,995
COUT-C-1	14,107	572	330	90	992	13,114
COUT-C-2	15,232	588	395	81	1,064	14,168
COUT-C-3 (Agency Preferred Alternative)	15,232	588	395	82	1,065	14,167
COUT-C-4	15,986	247	285	157	689	15,298
COUT-C-5	15,986	247	285	152	684	15,303
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	12,474	216	203	77	497	11,977
COUT-I	17,468	1,828	201	127	2,155	15,313
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions in the CIAA that have affected Mexican spotted owl potential habitats in the CIAA include fire management, oil and gas development, and pipeline corridors. The RFFA in the CIAA for Mexican spotted owl includes the construction of the TransWest Express Transmission Project. The extent of development associated with implementation of Alternatives COUT-C and its route variations, COUT-H, and COUT-I would be anticipated to contribute incrementally to fragmentation and modification of Mexican spotted owl potential habitat in the CIAA.

The extent of development associated with implementation of Alternatives COUT-A and COUT-B and the associated route variations would not be anticipated to contribute as extensively to fragmentation and modification of Mexican spotted owl potential habitat in the CIAA as the other COUT alternative routes.

If Mexican spotted owls are detected during preconstruction surveys, selective mitigation measures, including seasonal and spatial avoidance could be implemented to reduce potential effects. However, some vegetation structure in potential Mexican spotted owl habitat could be lost, as a result of clearing of trees to maintain a safe conductor height.

The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-100).

If construction and site stabilization actions for the Project along the alignments of the COUT alternative routes overlapped temporally with the development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of Mexican spotted owl from specialized and geographically limited nesting habitats or displacement of the species from a larger geographic area could be minimized or avoided through implementation of seasonal restrictions.

Greater Sage-grouse

The types of potential effects on greater sage-grouse that could occur under COUT alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.8.4. The estimated area of cumulative development in sage-grouse core areas or priority habitat, general habitat (including sage-grouse habitat in transmission line corridors designated in Wyoming Executive Order 2011-5), habitat within 4 miles of leks in core areas or priority habitat, and habitat within 4 miles of leks outside core areas and priority habitat for COUT alternative routes is summarized in Tables 4-101 through 4-103.

TABLE 4-101 GREATER SAGE-GROUSE CORE AREAS OR PRIORITY HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	742,366	144,296	10,970	746	156,012	586,354
COUT-A-1	740,349	144,246	10,950	745	155,941	584,408
Alternative COUT-B and Route Variations						
COUT-B	729,008	120,908	15,187	384	136,478	592,530
COUT-B-1	711,655	117,610	11,346	394	129,350	582,306
COUT-B-2	711,657	117,612	11,346	394	129,351	582,306
COUT-B-3	715,680	118,350	11,346	393	130,089	585,591
COUT-B-4	712,673	118,266	11,346	393	130,005	582,668
COUT-B-5	714,664	117,696	11,346	403	129,444	585,220

TABLE 4-101 GREATER SAGE-GROUSE CORE AREAS OR PRIORITY HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	621,626	92,289	14,554	343	107,186	514,440
COUT-C-1	607,345	90,233	10,713	354	101,300	506,045
COUT-C-2	607,344	90,233	10,713	353	101,299	506,045
COUT-C-3 (Agency Preferred Alternative)	610,351	90,317	10,713	357	101,386	508,965
COUT-C-4	606,463	90,179	10,713	356	101,249	505,215
COUT-C-5	609,471	90,263	10,713	345	101,321	508,150
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	653,230	101,137	18,508	341	119,986	533,244
COUT-I	615,436	109,362	11,064	427	120,852	494,584
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

TABLE 4-102 GREATER SAGE-GROUSE GENERAL HABITAT AND TRANSMISSION LINE CORRIDORS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	132,967	19,949	767	246	20,963	112,005
COUT-A-1	132,967	19,949	767	246	20,962	112,005
Alternative COUT-B and Route Variations						
COUT-B	132,967	19,949	767	243	20,960	112,007
COUT-B-1	132,967	19,949	767	245	20,961	112,006
COUT-B-2	132,967	19,949	767	245	20,961	112,006
COUT-B-3	132,967	19,949	767	245	20,961	112,006
COUT-B-4	132,967	19,949	767	245	20,961	112,006
COUT-B-5	132,967	19,949	767	250	20,967	112,000

TABLE 4-102 GREATER SAGE-GROUSE GENERAL HABITAT AND TRANSMISSION LINE CORRIDORS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	136,367	20,080	767	277	21,124	115,244
COUT-C-1	136,368	20,080	767	279	21,126	115,242
COUT-C-2	136,368	20,080	767	279	21,125	115,242
COUT-C-3 (Agency Preferred Alternative)	136,368	20,080	767	281	21,128	115,240
COUT-C-4	136,368	20,080	767	281	21,128	115,240
COUT-C-5	136,368	20,080	767	272	21,119	115,249
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	136,368	20,080	767	266	21,113	115,255
COUT-I	136,368	20,080	767	262	21,109	115,259
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

TABLE 4-103 GREATER SAGE-GROUSE HABITAT WITHIN 4 MILES OF LEKS IN CORE AREAS OR PRIORITY HABITATS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	374,989	51,016	9,015	429	60,460	314,529
COUT-A-1	374,388	51,007	9,010	429	60,445	313,943
Alternative COUT-B and Route Variations						
COUT-B	394,835	38,499	9,444	112	48,055	346,779
COUT-B-1	390,957	37,275	9,438	98	46,811	344,146
COUT-B-2	390,959	37,277	9,438	98	46,813	344,147
COUT-B-3	391,975	37,930	9,438	98	47,467	344,509
COUT-B-4	391,975	37,930	9,438	98	47,467	344,508
COUT-B-5	390,959	37,277	9,438	100	46,815	344,144

TABLE 4-103 GREATER SAGE-GROUSE HABITAT WITHIN 4 MILES OF LEKS IN CORE AREAS OR PRIORITY HABITATS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	311,209	26,580	9,093	98	35,771	275,438
COUT-C-1	309,410	26,536	9,088	84	35,707	273,703
COUT-C-2	309,410	26,536	9,088	83	35,707	273,703
COUT-C-3 (Agency Preferred Alternative)	309,410	26,536	9,088	84	35,708	273,702
COUT-C-4	309,410	26,536	9,088	84	35,708	273,702
COUT-C-5	309,410	26,536	9,088	81	35,705	273,705
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	281,669	25,287	8,923	80	34,290	247,379
COUT-I	266,261	25,409	8,857	162	34,429	231,832
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions in the CIAA that have affected sage-grouse designated habitats in the CIAA include fire management, coal and mineral mining, oil and gas development, pipeline corridors; as well as communication, transportation, and residential developments. RFFAs in the CIAA for designated sage-grouse habitats include the construction of the Gateway West and TransWest Express transmission projects and the Victory Pipeline Project as well as coal mining, oil and gas development, and wind energy and reservoir development. The extent of development associated with implementation of any of the COUT alternative routes would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse designated habitats in the CIAA (Tables 4-101 through 4-103).

Some of the Project impacts on sage-grouse associated with COUT alternative routes in Colorado would be in mapped general habitat and would not cross habitats within 4 miles of leks. Additionally, much of the development of the COUT routes in Colorado would be parallel to existing disturbances, including high traffic unpaved roads and existing oil and gas development in areas where general sage-grouse habitat would be intersected. The majority of the total available designated habitats for sage-grouse would not be developed by the Project or other cumulative actions (Tables 4-101 through 4-103).

Some of the Project impacts on sage-grouse associated with COUT alternative routes in Utah would occur in areas where the alternative would be parallel to an existing high-voltage transmission line that have degraded the existing quality of sage-grouse habitats. COUT alternative routes cross sage-grouse habitats within 4 miles of active leks, which are assumed to be the areas of highest importance for maintaining existing sage-grouse populations in Utah. However, sage-grouse habitats in the CIAA of the different COUT alternative routes and associated route variations have different attributes including population size, levels of lek attendance, stability, and connectivity to surrounding suitable habitats. Detailed descriptions of greater sage-grouse populations crossed by COUT alternative routes in Utah are located in Section 3.2.8. The magnitude of cumulative development in sage-grouse core areas or priority habitat, general habitat, habitat within 4 miles of leks in core areas, and habitat within 4 miles of leks in non-core

areas for all alternative routes by sage-grouse population in Utah, is summarized in Tables 4-101 through 4-103.

If greater sage-grouse are observed during preconstruction surveys for the Project, selective mitigation measures, including seasonal and spatial avoidance would be implemented to reduce potential effects. However, some cumulative impacts on vegetation structure providing contiguous sagebrush communities in greater sage-grouse habitat could occur.

If construction and site stabilization actions for the Project along the alignments of the COUT alternative routes may overlap temporally with the TransWest Express Transmission Project, synergistic temporal effects, including displacement of sage-grouse from geographically limited contiguous sagebrush habitats or displacement of the species from a larger geographic area could be minimized or avoided through implementation of seasonal restrictions.

Greater Sage-grouse Utah Populations Crossed by COUT Alternative Routes

Detailed descriptions of greater sage-grouse populations crossed by COUT alternative routes in Utah are located in Section 3.2.8.

The estimated area of cumulative development in sage-grouse core areas or priority habitat, and habitat within 4 miles of leks in core areas and priority habitats for COUT alternative routes by sage-grouse population is summarized in Tables 4-104 and 4-105.

TABLE 4-104 SAGE-GROUSE UTAH POPULATIONS (CORE AREAS OR PRIORITY HABITATS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
South Slope Uinta Population						
Alternative COUT-A and Route Variation						
COUT-A	147,682	53,737	371	157	54,265	93,416
COUT-A-1	147,682	53,737	371	157	54,265	93,416
Alternative COUT-B and Route Variations						
COUT-B	97,576	29,257	378	0	29,635	67,941
COUT-B-1	97,576	29,257	378	0	29,635	67,941
COUT-B-2	97,576	29,257	378	0	29,635	67,941
COUT-B-3	97,576	29,257	378	0	29,635	67,941
COUT-B-4	97,576	29,257	378	0	29,635	67,941
COUT-B-5	97,576	29,257	378	0	29,635	67,941
Halfway Hollow Population						
Alternative COUT-A and Route Variation						
COUT-A	144,660	34,148	379	231	34,758	109,902
COUT-A-1	144,660	34,148	379	231	34,758	109,902

TABLE 4-104 SAGE-GROUSE UTAH POPULATIONS (CORE AREAS OR PRIORITY HABITATS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-B and Route Variations						
COUT-B	144,660	34,148	379	228	34,756	109,904
COUT-B-1	144,660	34,148	379	230	34,757	109,903
COUT-B-2	144,660	34,148	379	230	34,757	109,903
COUT-B-3	144,660	34,148	379	230	34,757	109,903
COUT-B-4	144,660	34,148	379	229	34,757	109,903
COUT-B-5	144,660	34,148	379	235	34,762	109,898
Deadman’s Bench Population						
Alternative COUT-A and Route Variation						
COUT-A	83,243	9,037	358	127	9,522	73,722
COUT-A-1	83,243	9,037	358	127	9,522	73,722
Alternative COUT-B and Route Variations						
COUT-B	83,243	9,037	358	126	9,520	73,723
COUT-B-1	83,243	9,037	358	127	9,521	73,722
COUT-B-2	83,243	9,037	358	127	9,521	73,722
COUT-B-3	83,243	9,037	358	126	9,521	73,722
COUT-B-4	83,243	9,037	358	126	9,521	73,722
COUT-B-5	83,243	9,037	358	129	9,524	73,719
Alternative COUT-C and Route Variations						
COUT-C	122,426	21,129	358	273	21,759	100,666
COUT-C-1	122,426	21,129	358	275	21,762	100,664
COUT-C-2	122,426	21,129	358	275	21,761	100,665
COUT-C-3 (Agency Preferred Alternative)	122,426	21,129	358	277	21,764	100,662
COUT-C-4	122,426	21,129	358	277	21,763	100,662
COUT-C-5	122,426	21,129	358	268	21,755	100,671
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	122,426	21,129	358	263	21,749	100,677
COUT-I	122,426	21,129	358	259	21,745	100,681
Strawberry/Fruitland Population						
Alternative COUT-A and Route Variation						
COUT-A	155,783	17,797	486	230	18,514	137,269
COUT-A-1	155,783	17,797	486	230	18,514	137,269

TABLE 4-104 SAGE-GROUSE UTAH POPULATIONS (CORE AREAS OR PRIORITY HABITATS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-B and Route Variations						
COUT-B	3,273	94	0	0	94	3,179
COUT-B-1	3,273	94	0	0	94	3,179
COUT-B-2	3,273	94	0	0	94	3,179
COUT-B-3	3,273	94	0	0	94	3,179
COUT-B-4	3,273	94	0	0	94	3,179
COUT-B-5	3,273	94	0	0	94	3,179
Alternative COUT-C and Route Variations						
COUT-C	3,273	94	0	0	94	3,179
COUT-C-1	3,273	94	0	0	94	3,179
COUT-C-2	3,273	94	0	0	94	3,179
COUT-C-3 (Agency Preferred Alternative)	3,273	94	0	0	94	3,179
COUT-C-4	3,273	94	0	0	94	3,179
COUT-C-5	3,273	94	0	0	94	3,179
Emma Park Population						
Alternative COUT-A and Route Variation						
COUT-A	10,335	987	108	0	1,095	9,240
COUT-A-1	8,319	936	88	0	1,025	7,294
Alternative COUT-B and Route Variations						
COUT-B	148,759	13,388	4,672	29	18,090	130,669
COUT-B-1	131,527	10,094	837	37	10,968	120,559
COUT-B-2	131,529	10,096	837	37	10,970	120,559
COUT-B-3	135,552	10,833	837	37	11,708	123,845
COUT-B-4	132,546	10,749	837	37	11,624	120,922
COUT-B-5	134,536	10,179	837	38	11,055	123,482
Alternative COUT-C and Route Variations						
COUT-C	160,720	18,488	4,672	31	23,191	137,528
COUT-C-1	145,567	16,375	837	39	17,251	128,316
COUT-C-2	145,567	16,375	837	39	17,251	128,316
COUT-C-3 (Agency Preferred Alternative)	148,574	16,458	837	39	17,335	131,238
COUT-C-4	145,567	16,375	837	39	17,251	128,315
COUT-C-5	148,574	16,458	837	38	17,334	131,240
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	127,833	16,380	7,680	0	24,061	103,772
COUT-I	67,603	12,780	501	83	13,364	54,238

TABLE 4-104 SAGE-GROUSE UTAH POPULATIONS (CORE AREAS OR PRIORITY HABITATS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Anthro Mountain Population						
Alternative COUT-A and Route Variation						
COUT-A	35	4	0	0	4	31
COUT-A-1	35	4	0	0	4	31
Alternative COUT-B and Route Variations						
COUT-B	50,748	6,395	126	0	6,521	44,227
COUT-B-1	50,748	6,395	126	0	6,521	44,227
COUT-B-2	50,748	6,395	126	0	6,521	44,227
COUT-B-3	50,748	6,395	126	0	6,521	44,227
COUT-B-4	50,748	6,395	126	0	6,521	44,227
COUT-B-5	50,748	6,395	126	0	6,521	44,227
Alternative COUT-C and Route Variations						
COUT-C	76,779	11,007	248	39	11,294	65,485
COUT-C-1	77,771	11,067	248	40	11,354	66,417
COUT-C-2	77,771	11,067	248	40	11,354	66,417
COUT-C-3 (Agency Preferred Alternative)	77,771	11,067	248	40	11,355	66,417
COUT-C-4	76,891	11,014	248	40	11,301	65,589
COUT-C-5	76,891	11,014	248	39	11,300	65,591
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	76,779	11,007	248	38	11,292	65,487
COUT-I	76,779	11,007	248	37	11,292	65,487
Horn Mountain Population						
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	3,594	3,003	0	0	3,003	590
COUT-I	48,476	13,758	80	41	13,879	34,597
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

TABLE 4-105 SAGE-GROUSE UTAH POPULATIONS (HABITAT IN 4 MILES OF LEKS IN CORE AREAS OR PRIORITY HABITATS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
South Slope Uinta Population						
Alternative COUT-A and Route Variation						
COUT-A	66,874	23,304	217	135	23,656	43,218
COUT-A-1	66,874	23,304	217	135	23,656	43,218
Alternative COUT-B and Route Variations						
COUT-B	42,681	8,664	217	0	8,881	33,800
COUT-B-1	42,681	8,664	217	0	8,881	33,800
COUT-B-2	42,681	8,664	217	0	8,881	33,800
COUT-B-3	42,681	8,664	217	0	8,881	33,800
COUT-B-4	42,681	8,664	217	0	8,881	33,800
COUT-B-5	42,681	8,664	217	0	8,881	33,800
Alternative COUT-C and Route Variations						
Halfway Hollow Population						
Alternative COUT-A and Route Variation						
COUT-A	80,480	10,630	134	76	10,839	69,640
COUT-A-1	80,480	10,630	134	76	10,839	69,640
Alternative COUT-B and Route Variations						
COUT-B	80,480	10,630	134	75	10,838	69,641
COUT-B-1	80,480	10,630	134	75	10,839	69,641
COUT-B-2	80,480	10,630	134	75	10,839	69,641
COUT-B-3	80,480	10,630	134	75	10,839	69,641
COUT-B-4	80,480	10,630	134	75	10,839	69,641
COUT-B-5	80,480	10,630	134	77	10,840	69,639
Deadman’s Bench Population						
Alternative COUT-A and Route Variation						
COUT-A	29,311	3,242	49	23	3,313	25,998
COUT-A-1	29,311	3,242	49	23	3,313	25,998
Alternative COUT-B and Route Variations						
COUT-B	29,311	3,242	49	22	3,313	25,998
COUT-B-1	29,311	3,242	49	23	3,313	25,998
COUT-B-2	29,311	3,242	49	23	3,313	25,998
COUT-B-3	29,311	3,242	49	23	3,313	25,998
COUT-B-4	29,311	3,242	49	23	3,313	25,998
COUT-B-5	29,311	3,242	49	23	3,313	25,997
Alternative COUT-C and Route Variations						
COUT-C	29,311	3,242	49	83	3,373	25,938
COUT-C-1	29,311	3,242	49	84	3,374	25,937
COUT-C-2	29,311	3,242	49	83	3,374	25,937
COUT-C-3 (Agency Preferred Alternative)	29,311	3,242	49	84	3,374	25,936
COUT-C-4	29,311	3,242	49	84	3,374	25,936
COUT-C-5	29,311	3,242	49	81	3,372	25,939

TABLE 4-105 SAGE-GROUSE UTAH POPULATIONS (HABITAT IN 4 MILES OF LEKS IN CORE AREAS OR PRIORITY HABITATS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	29,311	3,242	49	80	3,370	25,941
COUT-I	29,311	3,242	49	78	3,369	25,942
Strawberry/Fruitland Population						
Alternative COUT-A and Route Variation						
COUT-A	72,994	10,891	390	195	11,477	61,518
COUT-A-1	72,994	10,891	390	195	11,477	61,518
Emma Park Population						
Alternative COUT-A and Route Variation						
COUT-A	1,828	54	6	0	60	1,768
COUT-A-1	1,226	44	0	0	44	1,182
Alternative COUT-B and Route Variations						
COUT-B	101,285	8,787	699	14	9,500	91,784
COUT-B-1	97,407	7,562	693	0	8,255	89,152
COUT-B-2	97,409	7,564	693	0	8,257	89,152
COUT-B-3	98,425	8,218	693	0	8,911	89,514
COUT-B-4	98,425	8,218	693	0	8,911	89,514
COUT-B-5	97,409	7,564	693	0	8,257	89,152
Alternative COUT-C and Route Variations						
COUT-C	103,383	10,104	699	15	10,817	92,566
COUT-C-1	101,584	10,060	693	0	10,753	90,832
COUT-C-2	101,584	10,060	693	0	10,753	90,832
COUT-C-3 (Agency Preferred Alternative)	101,584	10,060	693	0	10,753	90,832
COUT-C-4	101,584	10,060	693	0	10,753	90,832
COUT-C-5	101,584	10,060	693	0	10,753	90,832
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	73,843	8,811	528	0	9,339	64,504
COUT-I	52,588	8,181	463	83	8,727	43,861
Anthro Mountain Population						
Alternative COUT-B and Route Variations						
COUT-B	32,941	4,826	126	0	4,952	27,989
COUT-B-1	32,941	4,826	126	0	4,952	27,989
COUT-B-2	32,941	4,826	126	0	4,952	27,989
COUT-B-3	32,941	4,826	126	0	4,952	27,989
COUT-B-4	32,941	4,826	126	0	4,952	27,989
COUT-B-5	32,941	4,826	126	0	4,952	27,989

TABLE 4-105 SAGE-GROUSE UTAH POPULATIONS (HABITAT IN 4 MILES OF LEKS IN CORE AREAS OR PRIORITY HABITATS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-C and Route Variations						
COUT-C	32,941	4,826	126	0	4,952	27,989
COUT-C-1	32,941	4,826	126	0	4,952	27,989
COUT-C-2	32,941	4,826	126	0	4,952	27,989
COUT-C-3 (Agency Preferred Alternative)	32,941	4,826	126	0	4,952	27,989
COUT-C-4	32,941	4,826	126	0	4,952	27,989
COUT-C-5	32,941	4,826	126	0	4,952	27,989
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	32,941	4,826	126	0	4,952	27,989
COUT-I	32,941	4,826	126	0	4,952	27,989
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

South Slope Uinta Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-4) in the CIAA for the species, core areas and priority habitats, as well as habitats within 4 miles of leks supporting the South Slope Uinta population, would be affected directly by Alternative COUT-A and Route Variation COUT-A-1. Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated South Slope Uinta population in the CIAA include residential and oil and gas development. The RFFA in the CIAA for core and priority habitats includes the construction of the TransWest Express Transmission Project and the Victory Pipeline Project. The extent of development associated with implementation of Alternative COUT-A and Route Variation COUT-A-1 would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse designated habitats in the CIAA (Tables 4-104 and 4-105).

Project impacts on sage-grouse habitat supporting the South Slope Uinta population associated with Alternative COUT-A and Route Variation COUT-A-1 would be in priority and core area habitat, as well as habitat within 4 miles of known leks. However, much of the development of the COUT alternative routes, where they are anticipated to cross the South Slope Uinta area, would be parallel to an existing EHV transmission line.

Halfway Hollow Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-4) in the CIAA for the species, core areas and priority habitats, as well as habitats within 4 miles of leks supporting the Halfway Hollow population, would be affected directly by Alternative COUT-A and Route Variation COUT-A-1 as well as COUT-B and the associated route variations. Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Halfway Hollow population in the

CIAA include mineral mining and oil and gas development. The RFFA in the CIAA for core and priority habitats includes the construction of the TransWest Express Project. A portion of the Project development of Alternative COUT-A, Route Variation COUT-A-1, Alternative COUT-B, and the associated route variations would occur outside areas affected by past, present, or RFFAs in the sage-grouse CIAA (Tables 4-104 and 4-105) and would contribute further to fragmentation and modification of sage-grouse designated habitats in the CIAA for this species.

Impacts on sage-grouse habitat supporting the Halfway Hollow population associated with development of Alternative COUT-A, Route Variation COUT-A-1, Alternative COUT-B, and the associated route variations would be in priority and core area habitat, as well as habitat within 4 miles of known leks. Much of the development of the COUT alternative routes, where they cross the Halfway Hollow area, would be parallel to an existing high-voltage transmission line.

Deadman's Bench Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-4) in the CIAA for the species, core areas and priority habitats, as well as habitats within 4 miles of leks supporting the Deadman's Bench population, would be affected directly by all the COUT alternative routes and route variations. Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Deadman's Bench population in the CIAA include mineral mining and oil and gas development. RFFAs in the CIAA for core and priority habitats include the construction of the TransWest Express Project as well as oil and gas development. The extent of development associated with implementation of the COUT alternative routes would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse designated habitats in the CIAA (Tables 4-104 and 4-105).

Project impacts on sage-grouse habitat supporting the Deadman's Bench population associated with implementation of the COUT alternative routes and their route variations would be in priority and core area habitat as well as habitat within 4 miles of known leks. Some of the development of the COUT alternative routes, where they are anticipated to cross the Deadman's Bench area, would be parallel to an existing EHV transmission line.

Strawberry/Fruitland Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-4) in the CIAA for the species, core areas and priority habitats as well as habitats within 4 miles of leks supporting the Strawberry/Fruitland population are directly affected by Alternative COUT-A and Route Variation COUT-A-1. Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Strawberry/Fruitland population in the CIAA include residential and oil/gas development. RFFAs in the CIAA for core and priority habitats include the construction of the TransWest Express transmission Project, as well as oil and gas development. The extent of development associated with implementation of Alternative COUT-A and Route Variation COUT-A-1 would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse designated habitats in the CIAA (Tables 4-104 and 4-105).

Project impacts on sage-grouse habitat supporting the Strawberry/Fruitland population associated with implementation of Alternative COUT-A and Route Variation COUT-A-1 would be in priority and core area habitat as well as habitat within 4 miles of known leks. Much of the development of Alternative COUT-A and Route Variation COUT-A-1 would be parallel to an existing EHV transmission line, where they are anticipated to cross the Strawberry/Fruitland area.

Emma Park Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-4) in the CIAA for the species, core areas and priority habitats, as well as habitats within 4 miles of leks supporting the Emma Park population, would be affected directly by Alternatives COUT-B and COUT-C and their associated route variations, as well as Alternative COUT-I. Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Emma Park population in the CIAA include fire management, coal and other mineral mining, residential and oil and gas development. RFFAs in the CIAA for core and priority habitats include the construction of the TransWest Express Transmission Project as well as coal mining.

The extent of development associated with implementation associated with Alternatives COUT-B and COUT-C (not including the associated route variations) would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse core areas and priority habitats as well as habitats within 4 miles of known leks in the CIAA (Tables 4-104 and 4-105).

The extent of development associated with implementation associated with implementation of Alternatives COUT-B and COUT-C route variations as well as Alternative COUT-I would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse core areas and priority habitats in the CIAA (Tables 4-104 and 4-105). However, Alternatives COUT-B and COUT-C route variations avoid habitats within 4 miles of known leks in core areas and priority habitats supporting the Emma Park population, which are assumed to be the areas of highest importance for maintaining existing sage-grouse populations in Utah. Alternative COUT-I crosses habitats within 4 miles of leks in core areas and priority habitat outside areas affected by past, present, or RFFAs in the sage-grouse CIAA (Tables 4-104 and 4-105) and would further contribute to fragmentation and modification of habitats within 4 miles of leks in sage-grouse core areas and priority habitats in the CIAA for this species.

Project impacts on sage-grouse habitat supporting the Emma Park population associated with Alternatives COUT-B, COUT-C, and their associated route variations, as well as COUT-I would be in priority and core area habitat as well as habitat within 4 miles of known leks. Much of the development of Where they cross the Emma Park area, Alternatives COUT-B and COUT-C and their associated route variations would be in areas of existing oil and gas development.

Anthro Mountain Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-4) in the CIAA for the species, core areas and priority habitats as well as habitats within 4 miles of leks supporting the Anthro Mountain population are directly affected by Alternatives COUT-C and the associated route variations, COUT-H, and COUT-I. Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Anthro Mountain population in the CIAA include mineral mining and oil and gas development. The RFFA in the CIAA for core and priority habitats includes the construction of the TransWest Express Transmission Project. The extent of development associated with implementation of any of the Alternatives COUT-C and the associated route variations, COUT-H, and COUT-I would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse core areas and priority habitats in the CIAA (Tables 4-104 and 4-105).

Project impacts on sage-grouse habitat supporting the Anthro Mountain population associated with Alternative COUT-C and the associated route variations, COUT-H, and COUT-I would be in priority and core area habitat but not in habitats within 4 miles of known leks in priority and core areas.

Horn Mountain Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-4) in the CIAA for the species, core areas and priority habitats as well as habitats within 4 miles of leks supporting the Horn Mountain population are directly affected by Alternative COUT-I. Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Horn Mountain population in the CIAA include fire management, coal mining, and oil/gas development. The RFFA in the CIAA for core and priority habitats includes the construction of the TransWest Express Transmission Project. The extent of development associated with implementation of any of the Alternative COUT-I would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse core areas and priority habitats in the CIAA (Tables 4-104 and 4-105).

Project impacts on sage-grouse habitat supporting the Horn Mountain population associated with Alternative COUT-I would be in core areas and priority habitat but not within 4 miles of known leks in core areas and priority habitat. Much of the development of Alternative COUT-I where they cross the Horn Mountain area, would be parallel to an existing EHV transmission line.

White-tailed Prairie Dog

The estimated area of cumulative development in potential white-tailed prairie dog habitat for COUT alternative routes is summarized in Table 4-106.

TABLE 4-106 WHITE-TAILED PRAIRIE DOG POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	2,398	263	155	159	550	1,848
COUT-A-1	2,398	263	155	159	550	1,848
Alternative COUT-B and Route Variations						
COUT-B	2,499	230	183	156	569	1,930
COUT-B-1	2,390	218	159	157	534	1,856
COUT-B-2	2,390	218	159	157	534	1,856
COUT-B-3	2,390	218	159	157	534	1,856
COUT-B-4	2,390	218	159	157	534	1,857
COUT-B-5	2,390	218	159	160	538	1,853
Alternative COUT-C and Route Variations						
COUT-C	1,799	141	31	186	358	1,441
COUT-C-1	1,691	130	6	188	324	1,367
COUT-C-2	1,691	130	6	188	323	1,368
COUT-C-3 (Agency Preferred Alternative)	1,691	130	6	189	325	1,366
COUT-C-4	1,692	130	6	189	325	1,367
COUT-C-5	1,692	130	6	183	319	1,373

TABLE 4-106 WHITE-TAILED PRAIRIE DOG POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	1,715	133	8	179	320	1,394
COUT-I	2,122	132	28	227	387	1,735
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions in the CIAA that have affected white-tailed prairie dog potential colonies in the CIAA include fire management, coal and other mineral mining, oil and gas development, residential and industrial development, and pipeline corridors. RFFAs in the CIAA for white-tailed prairie dog include the construction of the TransWest Express Transmission Project, the Victory Pipeline Project, and oil and gas development. The extent of development associated with implementation of any of the COUT alternative routes would be anticipated to contribute incrementally to fragmentation and modification of white-tailed prairie dog potential colonies in the CIAA. Potential white-tailed prairie dog colonies adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4. The magnitude of development associated with implementation of COUT alternative routes in white-tailed prairie dog potential colonies could be reduced, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure.

The majority of total available potential colonies for this species would not be developed by the Project or other cumulative actions (Table 4-106).

Black-footed Ferret

The estimated area of cumulative development in black-footed ferret management areas for COUT alternative routes is summarized in Table 4-107.

TABLE 4-107 BLACK-FOOTED FERRET MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-A and Route Variation						
COUT-A	11,417	511	281	19	812	10,605
COUT-A-1	11,417	511	281	19	812	10,605

TABLE 4-107 BLACK-FOOTED FERRET MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Alternative COUT-B and Route Variations						
COUT-B	11,417	511	281	19	811	10,605
COUT-B-1	11,417	511	281	19	812	10,605
COUT-B-2	11,417	511	281	19	812	10,605
COUT-B-3	11,417	511	281	19	812	10,605
COUT-B-4	11,417	511	281	19	812	10,605
COUT-B-5	11,417	511	281	20	812	10,604
Alternative COUT-C and Route Variations						
COUT-C	16,514	1,826	104	152	2,082	14,432
COUT-C-1	16,514	1,826	104	153	2,083	14,431
COUT-C-2	16,514	1,826	104	153	2,083	14,431
COUT-C-3 (Agency Preferred Alternative)	16,514	1,826	104	154	2,084	14,430
COUT-C-4	16,514	1,826	104	154	2,084	14,430
COUT-C-5	16,514	1,826	104	149	2,079	14,435
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	16,514	1,826	104	146	2,076	14,438
COUT-I	16,514	1,826	104	144	2,074	14,440
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

A past and present action in the CIAA that has affected black-footed ferret management areas in the CIAA includes fire management. The RFFA in the CIAA for black-footed ferret includes the construction of the TransWest Express Transmission Project.

The extent of development associated with implementation of the Alternatives COUT-A and COUT-B, and their associated route variations would be anticipated to contribute incrementally to fragmentation and modification of black-footed ferret management area in the CIAA.

The extent of development associated with implementation of Alternatives COUT-C (and its route variations), COUT-H, and COUT-I would be anticipated to contribute incrementally to fragmentation and modification of black-footed ferret management area in the CIAA.

The potential effects on black-footed ferret that could occur under the COUT alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.8.4. COUT alternative routes would intersect the Wolf Creek black-footed ferret management area. Black footed-ferret occurrences have not been recorded since a 2009/2010 plague affected the Wolf Creek ferret population, ferrets have not been located in the last 2 years, and reintroductions are not currently taking place (Ausmus 2012). However, if black-footed ferret reintroductions are resumed in the future, the COUT alternative routes could result in effects described in Section 3.2.8.4.

The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-107).

4.3.9 Fish and Aquatic Resources

The general approach for analysis of cumulative effects on aquatic habitats including the geographic and temporal scopes defined for analysis is presented in Table 4-3. This analysis relies on direct and indirect impacts from the Project detailed in Section 3.2.9 and are considered in conjunction with the past, present, and RFFAs listed in Tables 4-1 and 4-2.

Known occurrences of special status fish and aquatic species occurring within 1 mile of the reference centerlines, critical habitats for federally listed special status fish and aquatic species occurring within 1 mile of the reference centerlines, and general fish and aquatic habitats occurring within 300 feet of the reference centerlines are identified and quantitatively analyzed in Section 3.2.9.5.

The Project and other past, present, and RFFAs are not likely to result in direct effects on listed special status fish, amphibians, or designated critical habitats. This assumption is based on the premise that development of facilities in aquatic habitats or in proximity to aquatic habitats is undesirable from a constructability standpoint and because federal and state laws mandate the avoidance of impacts on aquatic habitats. Because the likelihood of direct impacts on fish and aquatic resources is improbable, a quantitative assessment of effects are analyzed in this section, rather a qualitative discussion of actions, which could result in cumulative and incremental effects on aquatic habitats including those designated as critical habitats for federally listed endangered fish species, will be the main focus of this section.

Given that water quality and aquatic habitats are highly interrelated, this section is supported by the quantitative assessment of impacts on surface-water quality, detailed in Section 4.3.4.3. The water resources cumulative effects analysis uses the ground disturbance model described in Section 2.5.1.2 and the quantitative direct and indirect impacts of the Project in conjunction with other past, present, and RFFAs in a particular subbasin on the water resources identified in Section 3.2.4.3.2 with a particular focus on how those actions would affect surface-water quality. Results of that analysis serve as supporting information for the qualitative discussion of indirect impacts on fish and aquatic resources, which are described in the following sections.

In addition to using the results of the water-resources quantitative analysis, this qualitative analysis of fish and aquatic resources will take into account the effects of the Project and other past, present, and RFFAs in subbasins particularly sensitive to ground-disturbing activities. These watersheds include areas with high erosion potential (refer to Section 3.2.2), impaired or outstanding waters (refer to Section 3.2.4), and areas known to support special status species and general aquatic habitats (refer to section 3.2.9).

4.3.9.1 Issues Identified for Analysis

Issues related to the effects of the Project and other past, present, and reasonably foreseeable future actions on fish and aquatic resources analyzed in this section were identified by the public and the Agency Interdisciplinary Team during scoping. Analysis was conducted using the best available data for fish and aquatic resources.

4.3.9.1.1 Potential Impacts on Federally Listed Endangered Fish and Designated Critical Habitats

Habitat quality is the primary limiting factor of any fish or aquatic species population and can be tied directly to recruitment and fecundity, as well as short- and long-term survivability. Federally listed species are particularly prone to disturbance, which can result in alterations and degradation of habitat

quality. The Determination of Critical Habitat for Colorado River Fishes (FWS 1994b) cites that “large-scale development and introduction of nonnative species” are the leading causal factors leading up to the 1994 listing and subsequent designation of critical habitat for the four native Colorado River fishes.

4.3.9.1.2 Potential Impacts on BLM, USFS, and State-listed Special Status Fish and Aquatic Species

Modification of habitat components which regionally rare or justifiably sensitive fish and aquatic species depend on can result in direct and indirect impacts on populations on the local level and/or across a species’ known range. Similar to species listed under the ESA; BLM, USFS, and state-listed special status species are highly prone to adverse impacts from project related disturbance resulting in habitat alteration.

4.3.9.1.3 Potential Impacts on Aquatic Habitats Supporting Fish, Amphibians, and Other Aquatic Organisms

Modification of aquatic habitats supporting fish, amphibians, and other aquatic organisms can result from direct and indirect impacts including ground disturbance, water draw down, and direct take from recreation.

4.3.9.2 Existing Condition

Residential, agricultural, and infrastructure development has influenced natural aquatic habitats throughout the CIAA. Development and expansion of residential areas can have an effect on fish and aquatic resources mainly due to an increase in the number of people living in a given area. As populations grow the need for and consumption of water in municipal areas increases. To accommodate peoples need for water, facilities have been constructed that affect the natural condition of aquatic habitats. These facilities range from water storage structures, modification of stream channels for flood control, sourcing and treatment of stream-born water for municipal use, and post-treatment of effluent which is then discharged into waterbodies. These modifications can result in both beneficial and adverse short- and long-term effects on fish and aquatic resources.

Agricultural practices in the Project area also have an effect on fish and aquatic resources. Two contributing factors that resulted in modification to natural aquatic habitats include the construction of water impoundments and the contribution of sediment and nutrients into aquatic habitats. Construction of impoundments has been a standard practice for centuries allowing farmers and ranchers to produce crops and livestock in areas where, without water-storage facilities such areas would not be conducive for agriculture. This has resulted in many natural lotic habitats being dammed, creating lentic habitats that support a far greater range of fish species while at the same time, limiting habitat available for native species dependent on lotic habitats. This cause-and-effect scenario has resulted in both adverse and beneficial impacts on fish and aquatic resources through modification of natural habitats.

Agricultural practices are also responsible for the degradation of aquatic habitats through the nonpoint and point discharge of nutrient and sediment-rich effluent. These adverse effects result from the application of herbicides, pesticides, and fertilizers to fields, which are transported to aquatic habitats as irrigation water is returned to canals, rivers, reservoirs, etc. Another nonpoint source of effluent is generated from dairies or areas heavily used for grazing livestock. Effluent mostly consists of sediment and nutrients that if uncontrolled can overload aquatic systems, modifying the abiotic and biotic processes necessary to maintain natural functioning aquatic conditions.

Agricultural processes that modify riparian and wetland habitats can affect aquatic habitats by decreasing soil stability and removing shade which in turn, results in higher water temperatures, decreased oxygen potential, and increased embeddedness of the substrate, which reduces breeding habitat that many species rely on for reproduction. The results of agricultural practices can include a shift in fish and aquatic species

inhabiting aquatic habitats, changes in water temperature and chemistry, and potential introduction of invasive species due to changes in riparian and wetland functionality, flow dynamics, water quality, and habitat availability.

Development of infrastructure can result in indirect and direct effects on fish and aquatic resources. The main contributing factor affecting fish and aquatic resources resulting from the development of infrastructure can be linked to ground disturbance that generates erosion and subsequent sedimentation to receiving waters. For the most part, projects are designed to protect water resources and aquatic habitats. There are, however, indirect impacts that cannot be planned for such as accidental, project-related discharge of sediment as well as other environmentally harmful materials that can result in detrimental or adverse effects on fish and aquatic resources, namely through the degradation of water quality.

The introduction of game fish, non-native invasive fish, non-native invasive plants, and other aquatic organisms also can lead to adverse, sometimes irreversible effects on fish and aquatic resources. Introduction of these organisms can limit the space and resources that endemic aquatic species depend on, resulting in competition for habitat and limiting available resources for species with a narrow habitat niche.

4.3.9.3 Results

4.3.9.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Results of the cumulative effects analysis on aquatic habitats in the WYCO route grouping are summarized in Section 4.3.4, Table 4-37.

Aquatic habitats in the CIAA for the WYCO route grouping are distributed throughout nine subbasins (refer to Section 3.2.4) and include between 1,130,379 and 1,387,388 acres (refer to Table 4-37 in Section 4.3.4.3.1) of aquatic habitats depending on the route. Major perennial aquatic habitats in the area (detailed in Section 3.2.4.4) include, but are not limited to, the Medicine Bow, Upper North Platte, Little Snake, and White rivers, as well as Muddy Creek.

Ground-disturbing activities associated with past and present activities in the CIAA for the WYCO route group that may currently be affecting aquatic habitats include coal mines, historic fires since the year 2000, noncoal mines including the Sweetwater and Terry Hankins mines; oil and gas development, oil shale and tar sands development, pipelines including the Enterprise Mid-America and Western Expansion II pipelines; residential developments, vegetation management including fuel treatments, prescribed fires, habitat improvement projects, spike treatments, and mechanical treatments; and renewable energy facilities.

Past and present development has contributed to some level of ground disturbance that, over time, is expected to be reclaimed compliant with federal and state reclamation requirements. However, long-term impacts could result in removal or modification of riparian and wetland habitats and destabilization of soils in the watersheds feeding Muddy Creek and the Little Snake River in the Rawlins and Little Snake Field Offices where fragile soils are highly prone to erosion. Refer to Section 3.2.2 for a description and location of naturally erodible or otherwise fragile soils in the WYCO alternative route area. Where past and present development are not meeting reclamation requirements, some adverse effects could be impacting aquatic habitats by unreclaimed impacts on riparian, wetland, and/or aquatic habitats as well as increased sediment loading and water turbidity in the intermittent and perennial habitats proximal to the CIAA for the WYCO route grouping.

RFFAs in the CIAA for the WYCO route grouping include the proposed Project, the Rosebud coal mine, the Continental Divide-Creston Junction and Kerr-McGee oil and gas projects; the Gateway West and TransWest Express transmission projects, and the Hogback Ridge wind-energy project.

Ground disturbance from implementation of RFFAs, including the Project, would be expected to result in localized short-term, indirect adverse effects on fish and aquatic resources, namely through modification of habitats in the CIAA. Short-term impacts could include destabilization of sensitive or otherwise fragile soils and modification of upland, riparian, and wetland habitats potentially supporting amphibians and other aquatic or semi-aquatic species. These direct impacts on soils and vegetation could result indirectly in short-term elevated sediment loading in surface waters, increased water temperature, and decreased habitat availability; degrading the quality and availability of those habitats. However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas would be required for RFFAs authorized and implemented on BLM-administered land, state land, and waters of the U.S. Following reclamation of project disturbance, adverse impacts on aquatic habitats would be mostly or completely mitigated, resulting in normalized levels of sediment loading and water turbidity and revegetation of disturbed habitats.

The Upper Platte River lies in the CIAA for the WYCO route grouping. During Agency Interdisciplinary Team meetings for this Project, the issue of potential Project and cumulative effects on Lower Platte River endangered fish species was raised as a potential concern. There is the potential that the Project and other past, present, and RFFAs could affect designated critical habitat for the Platte River endangered fishes. A determination of effect will be detailed in the Project Biological Assessment.

The incremental effect of Project development estimated for the alternative routes in the WYCO route grouping differ only slightly among alternative routes. The Project development would account for approximately 472 to 1,380 acres (0.1 to 0.7 percent) of the total estimated cumulative effect on aquatic habitats in the CIAA. Development of the Project when added to the past, present, and RFFAs could result in potential cumulative effects on 169,246 to 220,720 acres (9 to 15 percent) of the total available aquatic habitats in the CIAA (refer to Table 4-37 in Section 4.3.4.3.1). However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, may reduce or minimize cumulative impacts on fish and aquatic resources as well as the aquatic habitats on which they rely.

4.3.9.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Results of the cumulative effects analysis on aquatic habitats in the COUT BAX route grouping are summarized in Section 4.3.4.3.2, Table 4-38.

Aquatic habitats in the CIAA for the COUT BAX route grouping are distributed throughout nine subbasins (refer to Section 3.2.4) and range between 1,503,678 and 1,709,251 acres depending on the route (refer to Table 4-38, Section 4.3.4.3.2). Major perennial aquatic habitats in the area (detailed in Section 3.2.4) include, but are not limited to, the Green, White, and San Pitch rivers as well as Curren, Huntington, Douglas, Salt, and West creeks.

Ground disturbance associated with past and present activities in the CIAA for the COUT BAX route group, which likely are affecting aquatic habitats include coal mines, recent forest fires (since 2000), noncoal mines, oil and gas developments, oil shale and tar sands development, pipelines including the Enterprise Mid-America and Western Expansion II projects; the Clear Creek residential development, and vegetation treatments ranging from fuels-management projects to habitat improvement projects.

Past and present development has resulted in some level of ground disturbance and/or alteration of upland, riparian, wetland, and aquatic habitats which could be contributing adverse impacts on fish and

aquatic resources in the CIAA of the COUT BAX route grouping. Where past and present projects are in proximity to aquatic habitats, there is the potential that ground disturbance has resulted in the removal of existing riparian and/or wetland vegetation especially in the Utah portion of the route grouping. Removal of riparian and wetland vegetation limits available habitat for semi-aquatic species that utilize terrestrial habitats for a portion of their life cycle (i.e., breeding, overwinter, etc.). Additionally, modification or removal of riparian or wetland vegetation can indirectly result in adverse impacts on water quality including increased sediment loads, increase water temperature, and changes in water chemistry. Ground disturbance is expected to be reclaimed compliant with federal and state reclamation requirements, mitigating adverse impacts. Beneficial effects of other past and present projects also could be affecting habitats utilized by fish and/or semi-aquatic species. Such effects would be attributed to habitat improvement projects where management of upland, riparian, wetland, and aquatic habitats could directly and indirectly improve habitat quality for those species.

Designated critical habitat for federally listed endangered Colorado River fishes is present in the CIAA for the COUT BAX route grouping. Past and present projects may have resulted in some short-term disturbance of upland habitats and potentially riparian and wetland habitats adjacent to the Green, White, and Yampa rivers. Those projects may have resulted in minor ground disturbance adjacent to critical habitats but because of the endangered status of those species, any incremental impacts from past and present projects since 1994 would have required Section 7 Consultation with the FWS and appropriate selective mitigation measures would have been identified to protect those species and their habitats. Long-term adverse impacts are not likely affecting the endangered Colorado River fishes from past and present projects.

RFFAs in the CIAA for the COUT BAX route grouping with assumed or implied ground disturbance would include the proposed Project, the Flat Canyon Coal tracts, the Narrows East Bench Diversion Dam and associated pipelines, proposed oil and gas developments, the TransWest Express transmission line, the Narrows Tunnel project, and the Shalom Electric Boulger timber salvage project.

Ground disturbance from implementation of RFFAs including the Project, would be expected to result in localized short-term, adverse cumulative effects on aquatic habitats in the CIAA. Short-term impacts could be attributed to ground-disturbing activities in proximity to aquatic habitats including designated critical habitat along the Green, Yampa, and White rivers as well as lentic and lotic habitats with a high probability of supporting BLM, USFS, and state-listed sensitive species. Impacts on upland, riparian, wetland, and aquatic habitats supporting fish and aquatic resources would result from project generated destabilization or compaction of soils and/or removal of upland, riparian, and wetland vegetation. Modification of soils and vegetation in proximity to aquatic habitats could result in short-term indirect adverse impacts on water quality by increasing the risk and severity of erosion caused sedimentation of waters or discharges into adjacent riparian and wetland areas. Increased water turbidity in the Green, White, and Yampa rivers is not expected to result in long-term adverse effects on federally listed endangered species namely because application of erosion control design features of the Proposed Action are expected to fully mitigate any potential discharge. Additionally, these rivers are known to convey large sediment loads and the fish inhabiting those habitats are accustomed to highly turbid waters. It is unlikely that, in the event erosion control design features of the Proposed Action were to fail, the minor amount of sediment that would reach these habitats would have any measureable effect.

Areas with steep slopes in proximity to aquatic habitats raises the potential that ground disturbance resulting from the Project as well as past, present, and RFFAs would discharge greater than normal volumes of sediment into aquatic habitats. Aquatic habitats in the COUT BAX route grouping support federally listed endangered fish and/or BLM, USFS, and/or state-listed special status fish as well as other aquatic species such as amphibians and macroinvertebrates. Increased sediment loads reduce habitat

quality and prove detrimental to fish and aquatic resources. Additional information regarding areas of fragile or otherwise highly erodible soils prone to erosion is provided in Section 4.3.4.

The incremental effect of Project development estimated for alternative routes in the COUT BAX route grouping differ only slightly between alternative routes. The incremental project development would account for approximately 1,586 to 1,962 acres (1.5 to 1.6 percent) of the total estimated cumulative effects on water resources in the CIAA. Development of the Project when added to the past, present, and RFFAs could result in potential cumulative effects on 106,510 to 119,603 acres (0.1 to 7.0 percent) of the total aquatic habitats in the CIAA (refer to Table 4-38, Section 4.3.4.3.2). However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on fish and aquatic resources as well as the aquatic habitats on which they rely.

4.3.9.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Results of the cumulative effects analysis on aquatic habitats in the COUT route grouping are summarized in Section 4.3.4.3.3, Table 4-39.

Aquatic habitats in the CIAA for the COUT route grouping are distributed throughout nine subbasins (refer to Section 3.2.4) and range between 1,393,697 and 1,642,154 acres depending on the route (refer to Table 4-39, Section 4.3.4.3.3). Many perennial systems occur in the CIAA and include but are not limited to the Duchesne, Green, Lake Fork, Price, Strawberry, Uinta, and White rivers as well as Argyle, Hop, Indian, Red, Salt, Soldier, Sowers, Thistle, Tie Fork, and Willow creeks.

Ground disturbance associated with past and present activities in the CIAA for the COUT route grouping that currently may be affecting aquatic habitats include active coal mines, Central Utah Telephone Fiber Optic communication lines, the lower Duchesne River Wetlands Project, recent forest fires (since 2000), noncoal mine leases on SITLA lands, oil and gas development on BLM-administered land, as well as SITLA-administered land and private holdings; oil shale and tar sands projects, pipelines including the Roosevelt, Enterprise Mid-America, Western Expansion II and the Magnum Gas Storage project; the Carbon County proposed ATV trail, a number of residential developments, and vegetation management projects including fuel, weed, and habitat treatment projects on BLM-administered land in the Vernal and White River Field Office boundaries.

Impacts of past and present projects in the COUT route grouping on endangered Colorado River fishes and critical habitats are expected to be the same as those discussed for the COUT BAX route grouping.

RFFAs in the CIAA for the COUT route grouping with assumed or implied ground disturbance would include the proposed Project, the Flat Canyon and Long Canyon coal mine leases, the Narrows Reservoir, East Bench diversion dam, Narrows tunnel and associated Upper Cottonwood and Oak Creek pipelines; the Price industrial complex, oil and gas development from the Kerr-McGee and Monument Butte projects, the Woodside power-generation facility, the Narrows highway relocation project, the Shalom Electric Boulder timber salvage project, and the TransWest Express Transmission Project.

Impacts on federal and state-listed special status species, designated critical habitats, and other aquatic and semi-aquatic habitats resulting from implementation of RFFAs in the COUT route grouping are expected to be the same as those described under the COUT BAX route grouping.

The incremental project development estimated for alternative routes in the COUT route grouping would account from approximately 1,362 to 2,177 acres (1.5 to 2 percent) of the total estimated cumulative development in the CIAA. Development of the Project when added to the past, present, and RFFAs could result in potential cumulative effects on 92,140 to 123,620 acres (1.5 to 8 percent) of the total aquatic

habitats in the CIAA (refer to Table 4-39, 4.3.4.3.3). However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on fish and aquatic resources as well as the aquatic habitats on which they rely.

4.3.10 Land Use

The approach for analysis of cumulative effects on land-use resources (existing and future land uses), including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.10) and considers them in conjunction with the past, present, and RFFAs listed in Tables 4-1 and 4-2.

The incremental effects of the Project cumulatively with other projects on existing land use are discussed cumulatively based on data for the current condition, the existing past and present actions, and RFFAs.

Existing land-use cumulative effects are included in the following discussions. For future land use, a list of the projects by alternative are presented, but no cumulative effects analysis was completed for this resource.

4.3.10.1 Issues Identified for Analysis

The following issues related to land use resources were identified.

4.3.10.1.1 Potential Impacts on Existing Land Uses or Land-management Objectives

Potential conflicts could include a variety of current and proposed land uses (e.g., agriculture, residential and industrial); these are discussed individually in this section. The conflicts would be more intense where the Project and other future and/or existing actions are occurring or planned to occur in the same geographic extent as various land use resources. These impacts would be intensified where existing actions have conflicted already with the uses that may have occurred in the past, or where an RFFA is proposed in the same area as the Project.

Whether the Project is compounding impacts on an existing use or RFFAs, the cumulative effect on an agricultural uses, for instance, may result in the need for relocation of operations or existing facilities related to agriculture. In addition, the Project may possibly require agricultural uses or related infrastructure to shift, in the short-term and long-term.

Land-use management objectives may require formal amendments or other provisions relevant to existing grazing allotments, state-managed leases, and in municipalities—commercial, industrial, and residential uses.

4.3.10.1.2 Potential Impacts on Existing and Future Land Uses

Potential impacts include crossing commercial, residential or agriculture uses; three examples of areas that may not be compatible with future utility projects. These impacts would be intensified where other existing actions have already affected the land uses, or an RFFA is proposed in the same area.

Whether the Project is directly or indirectly affecting an existing use or RFFAs, the cumulative effect on existing and future land uses may result in the overall land use changing or being modified based on all types of impacts and effects.

4.3.10.2 Existing Condition

4.3.20.2.1 Existing and Future Land Use

The predominant existing land uses in the Project area include grazing, rangeland, and agriculture. These, as well as commercial, industrial, public/quasi-public, school and educational, residential and communication facility land uses, occur in the geographic scope of the Project as past and present actions; however, commercial, public/quasi-public, school and educational, and communications facilities land uses would not occur in the Project right-of-way. Thus, cumulative impacts are not discussed for these uses in the results below. The future land uses and types of past and present projects occurring in the geographic scope include those listed for existing land use, as well as planned residential subdivisions, oil and gas exploration and production, mining, and the TransWest Express Transmission Project.

No separate analysis for cumulative effects was conducted for future land use because the projects are considered as RFFAs, and all resource types use these RFFAs as part of the cumulative effects analysis.

4.3.10.3 Results

The following sections discuss the results of cumulative effects analysis on existing land use for all alternative routes. Existing land uses are reported by use in Tables 4-108 through 4-114. The existing land use CIAA varies slightly from other resources analyzed for this Project. As discussed in Section 4.2, a combination of the existing land use inventory (Section 3.2.10.4.1), buffered transmission lines, pipelines, railroads, and roads were used to determine the spatial extent of existing development for all resources. To analyze the cumulative impacts for existing land use as an individual resource, the existing development layer was modified by extracting grazing/rangeland, agriculture, industrial, residential, and utilities from the existing inventory. Pipelines and transmission lines are used to determine the cumulative impacts on the five existing land uses discussed above but are not reported as part of the existing land use inventory. Roads are discussed qualitatively in Section 4.3.12. Individual roadway names are not discussed due to the volume of roads in the geographic scope for transportation and access.

For each land use resource discussed, a percentage of Project impact is provided if applicable. This percentage was calculated using the acreage of Project disturbance, divided by the total available resource acreage, resulting in the percentage of Project impact, as listed in the table above (and in each section following below).

As discussed previously, no analysis was conducted for future land use as these projects are being used in the analysis as the reasonably foreseeable future projects. For the future land use results section, refer to table (Table 4-3), with the list of the RFFAs by alternative route.

4.3.10.3.1 Existing Land Use Effects

The following sections summarize the cumulative effects on existing and future land use that would be crossed by all Project alternative routes (including route variations). A qualitative discussion follows each summary table. Each table lists by alternative route or route variation the total available resource, the development in acres (Project, past and present and RFFAs), the total amount of development, the percentage of Project impact, and the remaining resource. All results are displayed in acres and in some cases, in percentages. Percentages were calculated by dividing the acres of Project disturbance by the total available resource acres.

The qualitative discussion for each existing land use is summarized by route grouping. The discussion includes the past, present, and/or RFFAs that have occurred, or could occur, within the boundary of these existing land uses, in addition to the Project.

Grazing/Rangeland

TABLE 4-108 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (BUREAU OF LAND MANAGEMENT GRAZING/RANGELAND) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes							
Alternative WYCO-B and Route Variations							
WYCO-B (Applicant Preferred Alternative)	1,538,939	85,059	44,332	2,753	132,144	1,406,795	0.18
WYCO-B-1	1,538,939	85,059	44,332	2,768	132,159	1,406,780	0.18
WYCO-B-2 (Agency Preferred Alternative)	1,560,831	84,823	44,339	2,730	131,892	1,428,939	0.18
WYCO-B-3	1,538,939	85,059	44,332	2,703	132,094	1,406,845	0.18
Alternative WYCO-C and Route Variations							
WYCO-C	1,589,711	74,259	45,001	2,547	121,807	1,467,904	0.16
WYCO-C-1	1,589,711	74,259	45,001	2,563	121,823	1,467,889	0.16
WYCO-C-2	1,611,603	74,023	45,007	2,526	121,556	1,490,047	0.16
WYCO-C-3	1,589,711	74,259	45,001	2,498	121,757	1,467,954	0.16
Alternative WYCO-D and Route Variation							
WYCO-D	1,228,139	84,464	36,561	2,229	123,254	1,104,886	0.18
WYCO-D-1	1,228,139	84,464	36,561	2,186	123,211	1,104,929	0.18
Alternative WYCO-F and Route Variations							
WYCO-F	1,571,210	90,099	47,436	2,786	141,222	1,429,989	0.18
WYCO-F-1	1,571,210	90,099	47,436	2,801	141,237	1,429,973	0.18
WYCO-F-2	1,593,102	90,763	47,443	2,764	140,970	1,452,132	0.17
WYCO-F-3	1,571,210	90,999	49,436	2,737	141,172	1,430,038	0.17
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	1,386,521	79,790	6,509	2,690	88,989	1,297,533	0.19
COUT BAX-C	1,530,206	84,948	55,429	2,401	142,778	1,387,429	0.16
COUT BAX-E	1,523,411	89,812	35,433	2,713	127,958	1,395,453	01.8
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
Alternative COUT-A and Route Variation							
COUT-A	371,749	39,734	3,667	715	43,117	328,633	0.19
COUT-A-1	371,749	39,734	3,667	715	43,116	328,633	0.19
Alternative COUT-B and Route Variations							
COUT-B	410,390	40,736	3,632	708	45,076	365,314	0.17
COUT-B-1	402,962	40,036	3,625	736	44,397	358,564	0.18
COUT-B-2	402,962	40,036	3,625	823	44,484	358,477	0.20
COUT-B-3	402,962	40,036	3,625	778	44,439	358,523	0.19
COUT-B-4	402,962	40,036	3,625	822	44,484	358,478	0.20
COUT-B-5	402,962	40,036	3,625	796	44,457	358,504	0.20

TABLE 4-108 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (BUREAU OF LAND MANAGEMENT GRAZING/RANGELAND) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Alternative COUT-C and Route Variations							
COUT-C	856,714	125,994	6,723	1,140	133,856	722,858	0.13
COUT-C-1	854,407	125,989	6,753	1,211	133,953	720,454	0.14
COUT-C-2	854,407	125,989	6,753	1,300	134,043	720,365	0.15
COUT-C-3 (Agency Preferred Alternative)	854,407	125,989	6,753	1,265	134,007	720,400	0.15
COUT-C-4	854,407	125,989	6,753	1,376	134,118	720,289	0.16
COUT-C-5	854,407	125,989	6,753	1,286	134,028	720,379	0.15
Alternatives COUT-H and COUT-I							
COUT-H (Applicant Preferred Alternative)	874,896	135,386	6,634	1,094	143,114	731,782	0.13
COUT-I	949,505	134,313	10,871	1,709	142,893	806,612	0.18
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

TABLE 4-109 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (U.S. FOREST SERVICE GRAZING/RANGELAND) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	72,573	42,200	311	138	42,649	29,924	0.20
COUT BAX-C	72,573	42,200	311	135	42,647	29,926	0.19
COUT BAX-E	19,128	4,848	1,703	46	6,596	12,532	0.24
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
Alternative COUT-A and Route Variation							
COUT-A	156,860	14,549	1,201	229	15,979	140,881	0.15
COUT-A-1	161,462	14,579	1,203	233	16,015	145,446	0.14

TABLE 4-109 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (U.S. FOREST SERVICE GRAZING/RANGELAND) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Alternative COUT-B and Route Variations							
COUT-B	159,474	15,535	828	62	16,424	143,050	0.04
COUT-B-1	200,769	17,525	910	76	18,512	182,257	0.04
COUT-B-2	195,164	17,442	898	76	18,415	176,749	0.04
COUT-B-3	159,474	15,535	828	62	16,425	143,049	0.04
COUT-B-4	195,164	17,442	898	76	18,415	176,749	0.04
COUT-B-5	159,474	15,535	828	64	16,426	143,048	0.04
Alternative COUT-C and Route Variations							
COUT-C	138,488	14,224	552	65	14,841	123,646	0.05
COUT-C-1	179,782	16,215	635	80	16,929	162,853	0.04
COUT-C-2	174,178	16,131	623	79	16,833	157,345	0.05
COUT-C-3 (Agency Preferred Alternative)	138,488	14,224	552	66	14,842	123,645	0.05
COUT-C-4	174,178	16,131	623	80	16,834	157,344	0.05
COUT-C-5	138,488	14,224	552	64	14,840	123,648	0.05
Alternatives COUT-H and COUT-I							
COUT-H (Applicant Preferred Alternative)	19,128	4,848	1,703	51	6,602	12,526	0.30
COUT-I	72,573	42,200	311	145	42,656	29,916	0.20
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

TABLE 4-110 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (STATE GRAZING/RANGELAND) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes							
Alternative WYCO-B and Route Variations							
WYCO-B (Applicant Preferred Alternative)	10,892	515	783	211	1,509	9,382	2.00
WYCO-B-1	10,680	512	755	196	1,463	9,217	2.00
WYCO-B-2 (Agency Preferred Alternative)	10,892	515	783	211	1,509	9,383	2.00
WYCO-B-3	10,892	515	783	211	1,509	9,382	2.00
Alternative WYCO-C and Route Variations							
WYCO-C	11,447	598	932	213	1,743	9,703	2.00
WYCO-C-1	11,235	595	904	197	1,697	9,538	2.00
WYCO-C-2	11,447	598	932	213	1,743	9,704	2.00
WYCO-C-3	11,447	598	932	213	1,743	9,703	2.00
Alternative WYCO-D and Route Variation							
WYCO-D	18,679	2,270	619	312	3,201	15,478	2.00
WYCO-D-1	18,679	2,270	619	313	3,202	15,477	2.00
Alternative WYCO-F and Route Variations							
WYCO-F	11,452	561	828	205	1,595	9,858	2.00
WYCO-F-1	11,241	559	800	189	1,548	9,692	2.00
WYCO-F-2	11,452	561	828	204	1,594	9,858	2.00
WYCO-F-3	11,452	561	828	205	1,594	9,858	2.00
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	119,242	10,634	3,919	382	14,935	104,306	0.32
COUT BAX-C	128,277	12,076	6,175	183	18,434	109,843	0.14
COUT BAX-E	132,985	12,725	6,195	146	19,065	113,920	0.11
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
Alternative COUT-A and Route Variation							
COUT-A	16,782	1,088	238	97	1,423	15,359	0.60
COUT-A-1	16,782	1,088	238	97	1,423	15,359	0.60
Alternative COUT-B and Route Variations							
COUT-B	31,787	2,845	552	104	3,500	28,287	0.33
COUT-B-1	21,610	1,710	388	99	2,197	19,413	0.50
COUT-B-2	25,808	2,268	1,455	120	3,842	21,966	0.50
COUT-B-3	25,808	2,268	1,455	139	3,861	21,947	0.50
COUT-B-4	25,808	2,268	1,455	139	3,861	21,947	0.50
COUT-B-5	25,808	2,268	1,455	123	3,845	21,963	0.50

TABLE 4-110 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (STATE GRAZING/RANGELAND) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Alternative COUT-C and Route Variations							
COUT-C	68,200	41,232	574	113	41,919	26,281	0.20
COUT-C-1	60,156	40,708	554	108	41,370	18,786	0.20
COUT-C-2	61,215	41,180	1,467	130	42,777	18,438	0.20
COUT-C-3 (Agency Preferred Alternative)	61,215	41,180	1,467	131	42,778	18,437	0.20
COUT-C-4	63,474	40,691	1,477	225	42,393	21,080	0.40
COUT-C-5	63,474	40,691	1,477	218	42,386	21,088	0.30
Alternatives COUT-H and COUT-I							
COUT-H (Applicant Preferred Alternative)	57,660	40,811	345	100	41,256	16,404	0.20
COUT-I	95,086	42,580	975	199	43,754	51,332	0.20
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes Grazing/Rangeland

The percentage of the Project alternative routes located in grazing allotments would be less than 1 percent for all WYCO alternative routes and route variations on BLM land. The percentage of the Project alternative routes located in grazing allotments would be approximately 2 percent for all WYCO alternative routes and route variations on state land. Various past and present actions and RFFAs would occur throughout the grazing allotments on BLM-administered and state lands. The short-term cumulative effects of the Project, in addition to the past and present actions and RFFAs would include construction activities of projects that would require gates being added to existing fences; construction related disturbances (noise, vehicles/equipment, personnel) associated with development of access roads, site grading, and building structures; and larger footprints of disturbance before restoration activities occur. The long-term cumulative effects would be reduced grazing/rangeland available where permanent disturbance/structures footprints would occur from the projects.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes Grazing/Rangeland

The percentage of the Project alternative routes located in agriculture areas would be less than 1 percent for all COUT BAX alternative routes on BLM-administered land. The percentage of the Project alternative routes located in agriculture areas would be less than 1 percent for all COUT BAX alternative routes on USFS-administered land. The percentage of the Project alternative routes located in grazing allotments would be less than 1 percent for all COUT BAX alternative routes and route variations on state land. Various past and present actions and RFFAs would occur throughout the grazing allotments on BLM-administered and state lands. The short- and long-term cumulative effects would be similar to those discussed for WYCO alternative routes.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes Grazing/Rangeland

The percentage of the Project alternative routes located in grazing allotments would be less than 1 percent for all COUT alternative routes and route variations on BLM-administered land. The percentage of the Project alternative routes located in grazing allotments would be less than 1 percent for all COUT alternative routes and route variations on USFS-administered land. The percentage of the Project alternative routes located in grazing allotments would be less than 1 percent for all COUT alternative routes and route variations on state land. Various past and present actions and RFFAs would occur throughout the grazing allotments BLM-administered and state lands. The short- and long-term cumulative effects would be similar to those discussed for WYCO alternative routes.

Agriculture

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes Agriculture

The percentage of the Project alternative routes located in agriculture areas would be less than 1 percent for WYCO alternative routes and route variations. Past and present actions occurring in agricultural areas include: the Anadarko Atlantic Rim oil and gas development, BLM oil and gas units for the Little Snake and White River Field Offices, Colorado state land oil and gas leases, and Wyoming state land oil and gas leases. RFFAs proposed or planned in agricultural areas include TransWest Express, the Woodside power-generation facility, and the Continental Divide-Creston Junction oil and/or gas project. The short-term cumulative effects of the Project, in addition to the past and present actions and RFFAs could potentially limit access to fields or agriculture operations during construction of the projects. The long-term cumulative effects would be utility and industrial infrastructure that potentially could reduce the amount of and/or alter agriculture production lands.

TABLE 4-111 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (AGRICULTURE) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes							
Alternative WYCO-B and Route Variations							
WYCO-B (Applicant Preferred Alternative)	521	10	2	1	13	507	0.19
WYCO-B-1	521	10	2	1	13	507	0.19
WYCO-B-2 (Agency Preferred Alternative)	827	12	13	2	26	800	0.24
WYCO-B-3	521	10	2	1	13	507	0.19

TABLE 4-111 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (AGRICULTURE) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Alternative WYCO-C and Route Variations							
WYCO-C	518	10	2	1	13	505	0.19
WYCO-C-1	518	10	2	1	13	505	0.19
WYCO-C-2	824	11	13	2	26	798	0.24
WYCO-C-3	518	10	2	1	13	505	0.19
Alternative WYCO-D and Route Variation							
WYCO-D	14,857	332	241	61	634	14,223	0.41
WYCO-D-1	14,857	332	241	61	634	14,223	0.41
Alternative WYCO-F and Route Variations							
WYCO-F	519	10	2	1	13	506	0.19
WYCO-F-1	519	10	2	1	13	506	0.19
WYCO-F-2	825	11	13	2	26	799	0.24
WYCO-F-3	519	10	2	1	13	506	0.19
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	4,946	247	95	21	363	4,583	0.42
COUT BAX-C	4,946	247	95	21	363	4,583	0.42
COUT BAX-E	4,876	194	71	19	284	4,592	0.39
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
Alternative COUT-A and Route Variation							
COUT-A	11,919	1,164	184	75	1,423	10,496	0.63
COUT-A-1	11,919	1,164	184	75	1,423	10,496	0.63
Alternative COUT-B and Route Variations							
COUT-B	10,497	594	216	45	855	9,642	0.43
COUT-B-1	10,401	593	216	46	855	9,546	0.43
COUT-B-2	10,401	593	216	46	855	9,546	0.43
COUT-B-3	10,401	593	216	46	855	9,546	0.43
COUT-B-4	10,401	593	216	46	855	9,546	0.43
COUT-B-5	10,401	593	216	47	856	9,545	0.43
Alternative COUT-C and Route Variations							
COUT-C	2,364	150	45	9	204	2,160	0.38
COUT-C-1	2,183	149	40	9	203	1,985	0.38
COUT-C-2	2,183	149	40	9	203	1,985	0.38
COUT-C-3 (Agency Preferred Alternative)	2,183	149	40	9	203	1,985	0.38
COUT-C-4	2,265	149	45	9	203	2,061	0.38
COUT-C-5	2,265	149	45	9	203	2,062	0.38

TABLE 4-111 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (AGRICULTURE) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Alternatives COUT-H and COUT-I							
COUT-H (Applicant Preferred Alternative)	3,060	164	62	22	248	2,812	0.72
COUT-I	6,944	250	93	23	366	6,578	0.33
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes Agriculture

The percentage of the Project located in agriculture areas would be less than 1 percent for COUT BAX alternative routes. Past and present actions occurring in agricultural areas include BLM oil and/or gas units for the Moab, Vernal and White River Field Offices; Anadarko Petroleum Corporation Ferron natural gas project, SITLA-administered active oil and gas leases, Central Utah telephone fiber optic line, historic fire perimeters (2000 to 2011, and 2012), Western Expansion II (Enterprise Mid-America) Pipeline, and the Hiawatha Complex coalmine. RFFAs proposed or planned in agricultural areas include the TransWest Express, Clouse No. 1 Exemption Plat and Simple Land Division, the Woodside power-generation facility, and the Narrows proposed reservoir and associated utilities. The short- and long-term cumulative effects would be similar to those discussed for WYCO alternative routes.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes Agriculture

The percentage of the Project located in agriculture areas would be less than 1 percent for COUT alternative routes and route variations. Past and present actions occurring in agricultural areas include BLM habitat projects for the Vernal Field Office, oil and gas units for the Vernal Field Office, Atlantic Rim oil and gas field, Bill Barrett Corporation Blacktail Ridge EDA oil and/or gas development, Greater Deadman Bench oil and gas, Newfield Gusher Development oil and/or gas development, SITLA-administered active oil and gas leases, Anadarko Petroleum Corporation Ferron natural gas project, UDOGM oil well pads, historic fire perimeters (2000 to 2011, and 2012), Central Utah Telephone Fiber Optic Line, Roosevelt Pipeline; and the Brad Knight, Highland Estates, Ioka Meadows, Sunrise Estates, View, Cedar Mountain #6A, Dale Gines, Fruitland Ranchettes, Hidden Meadow, Lazy JP Ranchettes, Ledge Rock Cove, River Breeze Estates, and Sunrise Estates residential developments. RFFAs proposed or planned in agricultural areas include the TransWest Express Transmission Project, Clouse No. 1 Exemption Plat and Simple Land Division, the Woodside power-generation facility, and the Narrows proposed reservoir and associated utilities. The short- and long-term cumulative effects would be similar to those discussed for WYCO alternative routes.

Industrial

TABLE 4-112 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (INDUSTRIAL) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes							
Alternative WYCO-B and Route Variations							
WYCO-B (Applicant Preferred Alternative)	1,423	26	98	0	124	1,299	0.00
WYCO-B-1	1,423	26	98	0	124	1,299	0.00
WYCO-B-2 (Agency Preferred Alternative)	1,423	26	98	0	124	1,299	0.00
WYCO-B-3	1,423	26	98	0	124	1,299	0.00
Alternative WYCO-C and Route Variations							
WYCO-C	1,048	42	97	1	141	908	0.01
WYCO-C-1	1,048	42	97	1	141	908	0.01
WYCO-C-2	1,048	42	97	1	141	908	0.01
WYCO-C-3	1,048	42	97	1	141	908	0.01
Alternative WYCO-D and Route Variation							
WYCO-D	1,182	41	48	8	97	1,085	0.67
WYCO-D-1	1,182	41	48	8	97	1,085	0.67
Alternative WYCO-F and Route Variations							
WYCO-F	1,362	20	100	0	120	1,242	0.00
WYCO-F-1	1,362	20	100	0	120	1,242	0.00
WYCO-F-2	1,362	20	100	0	120	1,242	0.00
WYCO-F-3	1,362	20	100	0	120	1,242	0.00
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	2,070	977	20	4	1,001	1,069	0.19
COUT BAX-C	2,027	937	20	4	961	1,066	0.19
COUT BAX-E	1,892	973	47	1	1,021	872	0.05
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
Alternative COUT-A and Route Variation							
COUT-A	4,516	1,377	78	6	1,461	3,055	0.13
COUT-A-1	4,516	1,377	78	6	1,461	3,055	0.13
Alternative COUT-B and Route Variations							
COUT-B	4,946	1,305	89	3	1,397	3,549	0.06
COUT-B-1	4,318	1,280	69	3	1,352	2,966	0.07
COUT-B-2	4,318	1,280	69	3	1,352	2,966	0.07
COUT-B-3	4,318	1,280	69	3	1,352	2,966	0.07
COUT-B-4	4,318	1,280	69	3	1,352	2,966	0.07
COUT-B-5	4,318	1,280	69	3	1,352	2,966	0.07

TABLE 4-112 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (INDUSTRIAL) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Alternative COUT-C and Route Variations							
COUT-C	5,591	1,669	97	1	1,767	3,823	0.02
COUT-C-1	4,963	1,644	77	1	1,722	3,241	0.02
COUT-C-2	4,963	1,644	77	1	1,722	3,241	0.02
COUT-C-3 (Agency Preferred Alternative)	4,963	1,644	77	1	1,722	3,241	0.02
COUT-C-4	4,963	1,644	77	1	1,722	3,241	0.02
COUT-C-5	4,963	1,644	77	1	1,722	3,241	0.02
Alternatives COUT-H and COUT-I							
COUT-H (Applicant Preferred Alternative)	5,160	1,720	80	1	1,802	3,358	0.02
COUT-I	5,522	1,745	79	2	1,826	3,696	0.04
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes Industrial

The percentage of the Project located in industrial areas would be less than 1 percent for WYCO alternative routes and route variations. Past and present actions occurring in industrial areas include BLM oil and gas units for White River and Little Snake Field Offices, BLM spike treatment/vegetation management and prescribed fires for the BLM Rawlins Field Office, Wyoming and Colorado state land oil and gas leases, prescribed burns completed by the field office, and the Atlantic Rim oil and gas field. The RFFAs proposed or planned in industrial areas include two proposed high-voltage transmission lines (the TransWest Express and Gateway West), the Whirlwind I wind-energy facility, and the Continental Divide-Creston oil and gas development. The short-term cumulative effects of the Project in addition to the past and present actions and RFFAs could potentially limit access and/or creating potential traffic conflicts with industrial uses during construction of the projects. No long-term cumulative effects are anticipated.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes Industrial

The percentage of the Project located in industrial areas would be less than 1 percent for COUT BAX alternative routes. Past and present actions occurring in industrial areas include BLM oil and gas units for the Grand Junction, Moab, White River and Little Snake Field Offices; historic fire perimeters (2000 to 2011, and 2012), Intermountain Power Agency Wildcat loadout coal operation, Deserado existing coal mine and mine expansion, Enterprise Mid-America Pipeline Western Expansion II Project, Anadarko Petroleum Corporation Ferron natural gas project; SITLA-administered leases for metalliferous mineral leases, oil and gas, potash, and sand and gravel; Utah Division of Natural Resources-Oil, Gas and Mining oil and/or gas development, Star Point waste-fuel coal mine, and the Whites Sands missile launch facility at Green River. RFFAs proposed or planned in industrial areas are the proposed TransWest Express high-

transmission project, and the Woodside power-generation facility. The short- and long-term cumulative effects on industrial uses would be similar to those discussed for WYCO alternative routes.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes Industrial

The percentage of the Project located in industrial areas would be less than 1 percent for COUT alternative routes and route variations. Past and present actions occurring in industrial areas include: BLM oil and gas units for the Price and Vernal Field Offices; Utah Division of Natural Resources-Oil, Gas and Mining development; Berry Petroleum South Unit oil and/or gas development, Anadarko Petroleum Corporation Ferron Natural Gas Project, Bill Barrett Corporation Blacktail Ridge EDA oil and/or gas development, EOG Resources, Inc. Chapita Wells-Stagecoach Area natural gas development, Questar Exploration and Production Company Greater Deadman Bench, Kerr-McGee Oil and Gas Onshore LP Greater Natural Buttes oil and/or gas development, Newfield Gusher Development oil and/or gas development, Encana North Chapita Wells Natural Gas Development, XTO Energy's Riverbend directional infill oil and/or gas project, Gasco Energy, Inc. Uinta natural gas oil and/or gas development, Deer Creek coal mine, Deserado existing coal mine and mine expansion, Intermountain Power Agency Wildcat Loadout coal mine; SITLA leases for gilsonite, limestone, oil and gas, shale, and sand and gravel; BLM fuel-treatment/vegetation management and habitat projects for the Vernal Field Office, historic fire perimeters (2000 to 2011, and 2012), gilsonite mines; and the Clear Creek, Elk Tracks at Golden Eagle, Silver Moon, Vista Valley, Vonsville, Golden Eagle, Great Basin Estates I, and Cedar Mountain No. 8 and No. 9 in Duchesne County residential developments. RFFAs proposed or planned in industrial areas include TransWest Express, and the Kerr-McGee Oil and Gas Onshore LP Greater Natural Buttes oil and/or gas development. The short- and long-term cumulative effects on industrial uses would be similar to those discussed for WYCO alternative routes.

Residential

TABLE 4-113 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (RESIDENTIAL) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes							
Alternative WYCO-B and Route Variations							
WYCO-B (Applicant Preferred Alternative)	47	2	1	0	3	44	0.0
WYCO-B-1	47	2	1	0	3	44	0.0
WYCO-B-2 (Agency Preferred Alternative)	62	2	1	0	3	59	0.0
WYCO-B-3	47	2	1	0	3	44	0.0
Alternative WYCO-C and Route Variations							
WYCO-C	47	2	1	0	3	44	0.0
WYCO-C-1	47	2	1	0	3	44	0.0
WYCO-C-2	62	2	1	0	3	59	0.0
WYCO-C-3	47	2	1	0	3	44	0.0

TABLE 4-113 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (RESIDENTIAL) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Alternative WYCO-D and Route Variation							
WYCO-D	526	28	2	0	30	496	0.0
WYCO-D-1	526	28	2	0	30	496	0.0
Alternative WYCO-F and Route Variations							
WYCO-F	47	2	1	0	3	44	0.0
WYCO-F-1	47	2	1	0	3	44	0.0
WYCO-F-2	62	2	1	0	3	59	0.0
WYCO-F-3	47	2	1	0	3	44	0.0
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	721	43	5	0	48	674	0.0
COUT BAX-C	721	43	5	0	48	674	0.0
COUT BAX-E	767	51	5	0	56	711	0.0
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
Alternative COUT-A and Route Variation							
COUT-A	1,891	442	5	2	449	1,442	0.1
COUT-A-1	1,891	442	5	2	449	1,442	0.1
Alternative COUT-B and Route Variations							
COUT-B	1,265	177	3	0	180	1,085	0.0
COUT-B-1	1,293	177	4	0	181	1,112	0.0
COUT-B-2	1,266	177	3	0	180	1,086	0.0
COUT-B-3	1,266	177	3	0	180	1,086	0.0
COUT-B-4	1,266	177	3	0	180	1,086	0.0
COUT-B-5	1,266	177	3	0	180	1,086	0.0
Alternative COUT-C and Route Variations							
COUT-C	613	52	0	0	52	561	0.0
COUT-C-1	649	53	2	0	55	594	0.0
COUT-C-2	622	53	1	0	54	568	0.0
COUT-C-3 (Agency Preferred Alternative)	622	53	1	0	54	568	0.0
COUT-C-4	616	52	0	0	52	565	0.0
COUT-C-5	616	52	0	0	52	565	0.0
Alternatives COUT-H and COUT-I							
COUT-H (Applicant Preferred Alternative)	841	122	1	0	123	718	0.0
COUT-I	635	37	1	0	38	597	0.0
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes Residential

No cumulative effects are anticipated on residential areas.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes Residential

No cumulative effects are anticipated on residential areas.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes Residential

The percentage of the Project located in residential areas would be less than 1 percent for Alternative COUT-A and route variation. Past and present actions occurring in residential areas include BLM oil and/or gas units for the Price and Richfield Field Offices, Central Utah Telephone fiber optic line, Ferron natural gas project, SITLA-administered active oil and/or gas leases, sand and gravel permits, and historic fire perimeters (2000 to 2011, and 2012). RFFAs, proposed or planned, in residential areas include the TransWest Express, and the Narrows Dam and Reservoir Project (East Bench and Oak Creek Pipeline) in Sanpete County. The short-term cumulative effects of the Project in addition to the past and present actions and RFFAs could potentially limit and/or alter access to existing residential developments and produce noise during construction of the projects. The long-term cumulative effects could potentially restrict use of property where projects would occur on private lands.

Utilities

TABLE 4-114 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (UTILITIES) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes							
Alternative WYCO-B and Route Variations							
WYCO-B (Applicant Preferred Alternative)	3,235	1,099	183	41	1,323	3,195	1.27
WYCO-B-1	3,235	1,099	183	40	1,323	3,195	1.24
WYCO-B-2 (Agency Preferred Alternative)	3,235	1,099	183	40	1,323	3,195	1.24
WYCO-B-3	3,235	1,099	183	41	1,323	3,195	1.27
Alternative WYCO-C and Route Variations							
WYCO-C	3,797	1,538	209	41	1,789	3,756	1.08
WYCO-C-1	3,797	1,538	209	41	1,789	3,756	1.08
WYCO-C-2	3,797	1,538	209	41	1,789	3,756	1.08
WYCO-C-3	3,797	1,538	209	41	1,789	3,756	1.08
Alternative WYCO-D and Route Variation							
WYCO-D	5,422	1,172	1,196	71	2,440	5,350	1.31
WYCO-D-1	5,422	1,172	1,196	72	2,440	5,350	1.31

TABLE 4-114 CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (UTILITIES) FOR ALL ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Alternative WYCO-F and Route Variations							
WYCO-F	3,379	1,100	186	41	1,327	3,338	1.21
WYCO-F-1	3,379	1,100	186	41	1,327	3,338	1.21
WYCO-F-2	3,379	1,100	186	41	1,327	3,338	1.21
WYCO-F-3	3,379	1,100	186	41	1,327	3,338	1.21
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	604	324	23	4	351	600	0.66
COUT BAX-C	606	324	23	4	351	602	0.66
COUT BAX-E	638	360	27	4	391	635	0.63
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
Alternative COUT-A and Route Variation							
COUT-A	356	159	21	6	186	350	1.69
COUT-A-1	356	159	21	6	186	350	1.69
Alternative COUT-B and Route Variations							
COUT-B	366	146	24	6	176	360	1.64
COUT-B-1	366	146	24	6	176	360	1.64
COUT-B-2	366	146	24	6	176	360	1.64
COUT-B-3	366	146	24	6	176	360	1.64
COUT-B-4	366	146	24	6	176	360	1.64
COUT-B-5	366	146	24	6	176	360	1.64
Alternative COUT-C and Route Variations							
COUT-C	860	317	83	2	401	858	0.23
COUT-C-1	860	317	83	2	401	858	0.23
COUT-C-2	860	317	83	2	401	858	0.23
COUT-C-3 (Agency Preferred Alternative)	860	317	83	2	401	858	0.23
COUT-C-4	860	317	83	2	401	858	0.23
COUT-C-5	860	317	83	2	401	858	0.23
Alternatives COUT-H and COUT-I							
COUT-H (Applicant Preferred Alternative)	977	364	87	1	452	976	0.10
COUT-I	931	318	82	2	402	929	0.21
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes Utilities

The percentage of the Project located in the land-use category of utilities would be less than 2 percent for WYCO alternative routes and route variations. Past and present actions occurring in utility areas include: the Atlantic Rim oil and/or gas field final boundary, Chokecherry Wind Farm Expansion, Colorado state land and Wyoming state land oil and/or gas leases, Seven Mile Hill wind-energy facility, and Spike

Treatment (Vegetation Management) for the BLM Rawlins Field Office. RFFAs, proposed or planned, in utility areas includes Continental Divide-Creston Junction oil and/or gas project, the Gateway West, and TransWest Express, Rosebud coal exploration (permit boundary), and Woodside power-generation facility. The short-term cumulative effects of the Project in addition to the past and present actions and RFFAs could include cathodic protection where existing and future pipelines may be affected by not only the Project but other new transmission lines. No long-term cumulative effects anticipated for utilities.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes Utilities

The percentage of the Project located in the category of utilities would be less than 1 percent COUT BAX alternative routes. Past and present actions occurring in utility areas include BLM oil and/or gas units for the Grand Junction, Moab and White River Field Offices; SITLA-administered active oil and/or gas, and potash leases; Ferron natural gas project, Enterprise Mid-America pipeline, historic fire perimeters (2000 to 2011, and 2012), Skyline Mine, and Western Expansion II (Enterprise Mid-America) pipeline TUA. RFFAs, proposed or planned, in utility areas includes the Shalom Electric Boulger Timber Salvage – Vegetation Management, and TransWest Express. The short- and long-term cumulative effects on utilities would be similar to those discussed for WYCO alternative routes.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes Utilities

The percentage of the Project located in the land-use category of utilities would be less than 2 percent for COUT alternative routes and route variations. Past and present actions occurring in utility areas include BLM oil and/or gas units for the Price and White River Field Offices; fuel treatments (vegetation management) and habitat projects for the Vernal Field Office; SITLA-administered active gilsonite, oil shale, and oil and/or gas leases; Berry Petroleum South Unit oil and/or gas development, Bill Barrett Corporation Blacktail Ridge EDA oil and/or gas development, Chapita Wells/Stagecoach oil and/or gas project, Gasco Energy Inc. Uinta natural gas oil and/or gas development, Gilsonite mining, Greater Deadman, Lake Canyon EDA Boundary, Encana North Chapita Wells natural gas development, XTO Energy's Riverbend directional infill oil and/or gas project, Greater Natural Buttes Area gas development project EIS, Skyline mine, historic fire perimeters (2012), and UDOGM gas well pads. RFFAs, proposed or planned, in utility areas includes the Kerr-McGee, Shalom Electric Boulger Timber Salvage – Vegetation Management, and TransWest Express. The short- and long-term cumulative effects on utilities would be similar to those discussed for WYCO alternative routes.

4.3.11 Parks, Preservation, and Recreation

The approach for analysis of cumulative effects on recreational uses and resources in parks and associated with other recreation resources, including the geographic and temporal scopes defined for analysis is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.11) and considers them in conjunction with the past, present, and reasonably foreseeable future development listed in Tables 4-1 and 4-2. Potential cumulative effects on the visual resources (i.e., scenery and views) are addressed in Section 4.3.16. Also, impacts on National Trails Systems are discussed in Section 4.3.17.

4.3.11.1 Issues Identified for Analysis

4.3.11.1.1 Potential Impacts on Recreational Uses and Areas

Potential conflicts with recreational uses and areas include providing recreational users opportunities to leave the designated use area and use the right-of-way for the Project, placement of a transmission line

supporting structure in a recreation area that requires open space, such as a snow-kiting play area, and structure placement in a designated SRMA with management restrictions on utility development.

4.3.11.2 Existing Condition

In general, almost all parks, preservation, and recreation areas have been affected by development from past and present actions. However, the natural environment has been altered in a manner that allows for past and present recreation actions as well as recreational uses, such as recreational infrastructure, trails, scenic byways, etc. to occur.

4.3.11.3 Results

4.3.11.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Past, present, and RFFA in parks and recreation resource areas crossed by WYCO alternative routes are presented in Table 4-115, and the potential cumulative effects are discussed by parks and recreation resource below.

Effects

The following text summarizes the cumulative effects on recreational uses and resources in parks and associated with other recreation resources crossed by a WYCO alternative route or route variations, including what past and present actions and/or RFFAs in addition to the Project.

South Beach Public River Access Site

The Project would not contribute incrementally to cumulative effects on recreational uses at the South Beach Public River Access site because the Project would be located in an area of existing cumulative development for past actions. Also, the Project would be designed to span the site, so permanent infrastructure would not affect the site. Past and present actions that occur in the South Beach Public River Access site include oil and/or gas leases on Colorado state land, the Hayden to Artesia 345kV transmission line, the Bears Ears to Bonanza 345kV transmission line, two railroads, and Colorado State Highway 13. One RFFA is proposed in the CIAA, the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the South Beach Public River Access site, in addition to the past, present, and RFFAs, would include limited and/or altered access and increased noise during construction of the transmission projects. The long-term cumulative effect would include the additional transmission lines spanning the site.

Yampa River State Park

The Project would not contribute incrementally to cumulative effects on the Yampa River State Park because the Project right-of-way would be located in an area of existing cumulative development for past actions. Also, the Project would be designed to span the site, so permanent infrastructure would not affect the site. Past and present actions in the Yampa River State Park include the South Beach Public River Access Site, two railroads, and Colorado State Highway 13. There are no RFFAs in the Yampa River State Park. The short-term cumulative effects of the Project and past and present actions would be limited and/or altered access and increased noise during construction of the Project. The long-term cumulative effect would be the additional transmission line spanning the state park.

Cherokee Historic Trail

The Project would not contribute incrementally to cumulative effects on Cherokee Historic Trail because the Project would be designed to span the trail, so permanent infrastructure would not affect the trail. Past and present actions that occur in the Cherokee Historic Trail include secondary roads. RFFAs proposed or

planned in the trail include the Continental Divide-Creston Junction oil and gas project and the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the Cherokee Trail in addition to the RFFAs would be limited access to the trail and noise during construction would be increased. A long-term cumulative effect would be the additional transmission lines spanning the trail. Cumulative effects for the trail also are discussed in Section 4.3.17 and Section 4.3.18.

Overland Historic Trail

The Project would not contribute incrementally to cumulative effects on Overland Historic Trail because the Project would be designed to span the trail, so permanent infrastructure would not affect the trail. There are no past and present actions in the Overland Historic Trail. RFFAs in trail alignment include the Continental Divide-Creston Junction oil and gas project. The short-term cumulative effects of the Project crossing the Overland Historic Trail in addition to the RFFA would be limited access to the trail and increased noise occurring during construction. A long-term cumulative effect would be the additional transmission line spanning the trail. Cumulative effects for the trail also are discussed in Section 4.3.17 and Section 4.3.18.

Continental Divide National Scenic Trail

The Project would not contribute incrementally to cumulative effects on Continental Divide NST because the Project would be designed to span the trail, so permanent infrastructure would not affect the trail. Past and present actions in the Continental Divide NST include a secondary road aligned with the trail. A RFFA in the trail alignment is the Hogback Ridge wind energy project. The short-term cumulative effects of the Project crossing the Continental Divide NST in addition to the RFFA would be limited access to the trail and increased noise during construction of the projects. A long-term cumulative effect would be the additional transmission line spanning the trail. Cumulative effects for the trail also are discussed in Section 4.3.17.

Motorized Trails

The Project would not contribute incrementally to cumulative effects on motorized trails because the Project would be designed to span the trails, so permanent infrastructure would not be located directly on the trails. Past and present actions in the area traversed by the motorized trails include vegetation treatments completed by the BLM Little Snake Field Office and oil and/or gas leases on Colorado state lands. A RFFA in the area traversed by motorized trails would be the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing motorized trails in addition to the past and present actions and RFFAs would be limited access to the trails during construction. Long-term cumulative impacts on motorized trails would not be anticipated.

**TABLE 4-115
PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING
TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES**

Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming									
North Platte Special Recreation Management Area	Bureau of Land Management (BLM) Rawlins Field Office	WYCO alternative routes and route variations	5,000	332	18	0	350	4,650	0
Outlaw Trail Loop Scenic Drive ²	Carbon County	WYCO-B, WYCO-C, and WYCO-F and route variations	3	0	0	2	2	1	—
		WYCO-D, WYCO-D-1	228	8	14	154	176	52	—
Cherokee Historic Trail ²	National Park Service/BLM Rawlins Field Office	WYCO-B, WYCO-C, and WYCO-D and route variations	4	0	0	2	2	2	—
		WYCO-F and route variations	10	0	2	4	6	4	—
Overland Historic Trail ²	National Park Service/BLM Rawlins Field Office	WYCO-B, WYCO-C, WYCO-D, and WYCO-F and route variations	3	0	0	2	2	1	—
Rawlins to Baggs Historic Road (historic trail) ²	BLM Rawlins Field Office	WYCO-B, WYCO-C, and WYCO-F and route variations	4	0	0	2	2	2	—
		WYCO-D, WYCO-D-1	16	6	0	5	11	5	—
Continental Divide National Scenic Trail ²	U.S. Forest Service	WYCO-B, WYCO-C, WYCO-D, and WYCO-F and route variations	4	0	0	2	2	2	—

TABLE 4-115
PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING
TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Colorado									
South Beach Public River Access	Colorado Parks and Wildlife	WYCO-D, WYCO-D-1	164	164	0	0	164	0	0
Yampa River State Park	Colorado Parks and Wildlife	WYCO-D, WYCO-D-1	14	14	0	0	14	0	0
Juniper Mountain Special Recreation Management Area	BLM Little Snake Field Office	WYCO-D, WYCO-D-1	1,780	19	40	0	59	0	1,717
Motorized Trails ³	BLM Little Snake Field Office	WYCO-B, WYCO-C, and WYCO-F and route variations	36	3	3	16	22	14	—
		WYCO-D, WYCO-D-1	14	2	5	3	10	4	—
NOTES: ¹ Zero in Incremental Project Development indicates the alternative route and associated right-of-way overlaps past and present actions. ² Because of the length of the linear preservation and recreation features, cumulative effects on linear features are limited to the cumulative impact analysis area (CIAA). The percent of Incremental Project Development is reported for these features only in the CIAA. ³ Due to the number of motorized trails located in the CIAA, motorized trails were not analyzed individually. Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.									

Outlaw Trail Loop Scenic Drive

The Project would not contribute incrementally to cumulative effects on the Outlaw Trail Loop Scenic Drive because the Project would be designed to span the scenic highway, so no permanent infrastructure would be located directly on the scenic highway. No past or present actions have affected portions of the scenic highway easement in the CIAA for the WYCO alternative routes and route variations, except Alternative WYCO-D and route variation, and no RFFAs are in the CIAA. Cumulative effects of the Project crossing the Outlaw Trail Loop Scenic Drive for these alternative routes would be the same as what is described for direct and indirect impacts in Section 3.2.11 and Section 3.2.16.

For Alternative WYCO-D and route variation, past and present actions in the CIAA for the Outlaw Trail Loop Scenic Drive include the Atlantic Rim oil and/or gas field, spike treatments in the Rawlins Field Office, and Wyoming state land coal and oil and gas leases. RFFAs in the CIAA for the scenic highway include the Continental Divide-Creston Junction oil and gas project and the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the scenic highway in addition to past and present actions and RFFAs would be increased traffic and potential delays for users or required detours during construction of the Project. A long-term cumulative effect would be the additional transmission line spanning the scenic highway. Cumulative effects for the scenic highway also are discussed in Section 4.3.16.

Rawlins to Baggs Historic Road

The Project would not contribute incrementally to cumulative effects on the Rawlins to Baggs Historic Road (historic trail) because the Project would be designed to span the historic trail, so no permanent infrastructure would be located directly on the historic trail. No past or present actions have affected portions of the historic trail in the CIAA for the WYCO alternative routes and route variations, except Alternative WYCO-D and route variation. A RFFA in the historic trail includes the Hogback Ridge wind-energy project. The short-term cumulative effects of the Project crossing the Rawlins to Baggs Historic Road in addition to the RFFA potentially could limit access to the historic trail and increase noise occurring during construction. The long-term cumulative effects would be increased industrialization spanning the trail.

For Alternative WYCO-D and route variation past and present actions in the Rawlins to Baggs Historic Road would include Wyoming state land coal and oil and/or gas leases. RFFAs proposed or planned in the historic road alignment include the Continental Divide-Creston Junction oil and gas project and the Hogback Ridge wind-energy project. The short-term cumulative effects of the Project crossing the historic trail in addition to the past and present actions and RFFAs would be potentially limiting access to the historic trail and increased noise during construction. The long-term cumulative effects would be increased industrialization spanning the historic trail.

Juniper Mountain SRMA

The Project would not contribute incrementally to cumulative effects on the Juniper Mountain SRMA because the Project right-of-way is located in an area that has past and present actions and an RFFA. Past and present actions in the SRMA include secondary roads. A RFFA proposed in the SRMA include the TransWest Express Transmission Project. The short-term cumulative effects of the Project, past and present actions, and RFFA would potentially limit and/or hinder access to and/or in the SRMA and increase noise during construction. The long-term cumulative effects would be additional industrial development in the SRMA, which potentially could limit some recreational opportunities.

North Platte SRMA

The Project would not contribute incrementally to cumulative effects on the North Platte SRMA because the Project right-of-way is located in an area that has past and present actions. Past and present actions in

the SRMA include the ConocoPhillips, El Paso Corporation, Kinder Morgan, Inc., and ONEOK, Inc. pipelines; the Seminole to Sinclair 115kV transmission line, prescribed fires in the Rawlins Field Office, the Chokecherry Wind Farm Expansion, and secondary roads. A RFFA proposed in the SRMA include the Gateway West Transmission Project. The short-term cumulative effects of the Project, past and present actions, and RFFA potentially would limit and/or alter access to and in the SRMA and increase noise during construction. The long-term cumulative effects would be additional industrial development in the SRMA, which potentially could limit some recreational opportunities.

4.2.11.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Past and present actions and RFFAs located in parks, preservation, and recreation resource areas also are crossed by alternative routes considered in the COUT BAX route grouping are presented in Table 4-116 and the potential cumulative effects are discussed by parks, preservation, and recreation resource below.

Effects

Nephi Shooting Range

The Project would not contribute incrementally to cumulative effects on Nephi Shooting Range because the Project would be designed to span the site, so permanent infrastructure would not affect the site. Past and present actions that occur in the Nephi Shooting Range include the Fountain Green to Nebo 46kV transmission line. There are no RFFAs in the Nephi Shooting Range. The short-term cumulative effects of the Project crossing the Nephi Shooting Range in addition to the past and present actions would be limited access and operations of the shooting range during construction of the Project. The long-term effects on the Nephi Shooting Range are not anticipated.

Snow Kite Play Areas

The Project would not contribute incrementally to cumulative effects on the snow-kite play areas because the Project would be located in an area where other past and present actions are located. Past and present actions in the snow-kite play area include the Skyline Mine and secondary roads. RFFAs proposed or planned in the snow-kite play area include the TransWest Express Transmission Project and the Shalom Electric Boulder Timber Salvage vegetation management project. The short-term cumulative effects of the Project crossing the snow-kite play area in addition to the past and present actions and RFFAs would be minimal because construction actions would likely not occur in the area during the play area's peak use (winter). Long-term effects would be limited access to portions of the snow-kite play areas and an increased potential for user conflicts with above ground facilities associated with the proposed transmission facilities.

Old Spanish National Historic Trail

The Project would not contribute incrementally to cumulative effects on Old Spanish NHT because the Project would be designed to span the trail, so permanent infrastructure would not affect the trail. For Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E, past and present actions in the area traversed by the national historic trail include oil and/or gas leases in the BLM Moab Field Office, active SITLA-administered metalliferous mineral leases, active SITLA-administered potash leases, and the abandoned White Sands missile-launch facility at Green River, Utah. RFFAs do not occur in the area traversed by the trail for Alternative COUT BAX-E but Alternatives COUT BAX-B and COUT BAX-C have a RFFA proposed in the area traversed by the trail, the TransWest Express Transmission Project. Short-term cumulative effects of the Project crossing the Old Spanish NHT in addition to past and present actions and a RFFA would be limitation of access to the trail and increased noise during construction actions. A long-term cumulative effect would be increased industrialization spanning the trail alignment. Cumulative effects for the trail also are discussed in the Section 4.3.17 and Section 4.3.18.

TABLE 4-116 PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES									
Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Multi-State									
Dinosaur Diamond Scenic Byway ²	U.S. Department of Transportation, Federal Highway Administration	COUT BAX-B	13	2	0	6	8	5	–
		COUT BAX-C	21	4	2	9	16	5	–
		COUT BAX-E	26	6	6	8	20	6	–
Motorized Trails ^{2, 3}	Bureau of Land Management (BLM) and U.S. Forest Service	COUT BAX-B	121	5	11	61	77	44	–
		COUT BAX-C	162	5	54	59	118	44	–
		COUT BAX-E	129	5	14	62	81	49	–
Colorado									
There are no parks, preservation, or recreation resources crossed by the COUT BAX alternative routes in Colorado.									
Utah									
Snow Kite Play Areas	Sanpete County	COUT BAX-E	723	710	0	0	710	13	0.000
Nephi Shooting Range	City of Nephi	All COUT BAX alternative routes	37	37	0	0	37	0	0.000
Labyrinth Canyon SRMA	BLM Price Field Office	All COUT BAX alternative routes	34,240	23	3	2	28	37,175	0.005
Labyrinth Rims/ Gemini Bridges SRMA	BLM Moab Field Office	All COUT BAX alternative routes	300,650	4,435	71	39	4,545	295,428	–
San Rafael Swell SRMA	BLM Price Field Office	COUT BAX-B	938,500	5,197	3,629	72	8,898	927,527	0.007
		COUT BAX-C		5,197	3,629	0	8,826	927,599	0.000
Skyline Drive Scenic Backway ²	Manti-La Sal National Forest	COUT BAX-B, COUT BAX-C	3	1	2	0	3	0	–
Energy Loop Scenic Byway ²	Manti-La Sal National Forest	COUT BAX-E	24	7	12	3	22	2	–
Wedge Overlook/ Buckhorn Draw Scenic Backway ²	BLM Price Field Office	COUT BAX-B, COUT BAX-C	19	2	17	0 ¹	19	0	–

TABLE 4-116 PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES									
Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Old Spanish National Historic Trail ²	National Park Service	COUT BAX-B	91	8	2	44	54	37	–
		COUT BAX-C	39	12	7	6	25	14	–
		COUT BAX-E	32	12	0	6	18	14	–
Maple Fork Trail ²	Manti-La Sal National Forest	COUT BAX-E	3	0	0	2	2	1	–
Booths Canyon Trail ²	Manti-La Sal National Forest	COUT BAX-B, COUT BAX-C	3	3	0	0	3	0	–
NOTES: ¹ Zero in Incremental Project Development indicates the alternative route and associated right-of-way overlap past and present actions. ² Because of the length of the linear preservation and recreation features, cumulative effects on linear features are limited to the cumulative impact analysis area (CIAA). The percent of Incremental Project Development is reported for these features only in the CIAA. ³ Due to the number of motorized trails located in the CIAA, motorized trails were not analyzed individually. Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.									

Booths Canyon Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on Booths Canyon Non-motorized Trail because the Project would be designed to span non-motorized Trail, so permanent infrastructure would not affect the non-motorized trail. Past and present actions in the area traversed by the non-motorized trail include oil and/or gas leases in the BLM Richfield Field Office and the Millers Flat vegetation management project. A RFFA planned in the area traversed by the Booths Canyon Non-motorized Trail include a UDWR watershed restoration focus area. The short-term cumulative effects of the Project crossing the non-motorized trail in addition to the past and present actions and a RFFA could limit the access to the trail during construction actions. The long-term effects on the Booths Canyon Non-motorized trail would not be anticipated.

Maple Fork Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on Maple Fork Non-motorized Trail because the Project would be designed to span Maple Fork Non-motorized Trail, so permanent infrastructure would not affect the trail. There are no past and present actions or RFFAs in the area traversed by the Maple Fork Non-motorized Trail. The cumulative effects of the Project crossing the trail would be same as the direct and indirect impacts described in the Section 3.2.11.

Motorized Trails

The Project would not contribute incrementally to cumulative effects on motorized trails because the Project would be designed to span the trails, so permanent infrastructure would not be located directly on the trails. Past and present actions in the area traversed by the motorized trails include BLM oil and/or gas leases in the Moab Field Office, the Ferron Natural Gas Project, SITLA-administered oil and/or gas leases, the Wildcat Loadout, and White River Field Office range-improvement fencing. RFFAs proposed or planned in the area traversed by the motorized trails include the TransWest Express Transmission Project, Twin Bridges Resources oil and/or gas development, the Woodside power-generation facility, and UDWR watershed-restoration focus areas. The short-term cumulative effects of the Project crossing motorized trails in addition to the past and present actions and RFFAs would be limited access to the trails during construction actions. Long-term cumulative impacts on motorized trails would not be anticipated.

Dinosaur Diamond Scenic Byway

For Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E, the Project would not contribute incrementally to cumulative effects on Dinosaur Diamond Scenic Byway because the Project would be designed to span the scenic byway, so permanent infrastructure would not be located directly on the scenic byway. Past and present actions in the area traversed by the scenic byway include oil and/or gas leases in the BLM Moab Field Office, active SITLA-administered oil and/or gas leases, the Woodside to Sphinx 46kV transmission line, and Mounds to Moab 138kV transmission line. There would be no RFFAs for Alternative COUT BAX-B but for Alternatives COUT BAX-C and COUT BAX-E, RFFAs proposed or planned in the area traversed by the scenic byway include the Woodside power-generation facility. The short-term cumulative effects of the Project crossing the scenic byway in addition to past and present actions and RFFAs would be increased traffic, potential delays for users and/or detours during construction actions. A long-term cumulative effect would be increased industrialization along the scenic byway. Cumulative effects for the scenic byway also are discussed in Section 4.3.16.

Energy Loop Scenic Byway

The Project would not contribute incrementally to cumulative effects on Energy Loop Scenic Byway because the Project would be designed to span the scenic byway, so permanent infrastructure would not be located directly on the scenic byway. Past and present actions in the area traversed by the scenic

byway include the Skyline Mine, oil and/or gas leases in the BLM Price Field Office, and a railroad line. A RFFA proposed in the area traversed by the scenic byway would be the TransWest Express Transmission Project. Short-term cumulative effects of the Project crossing the scenic byway, in addition to past and present actions and a RFFA, would be increased traffic, potential delays for users and/or detours during construction actions. Long-term cumulative effects would be increased industrialization along the scenic byway. Cumulative effects for the scenic byway also are discussed in Section 4.3.16.

Skyline Drive Scenic Backway

The Project would not contribute incrementally to cumulative effects on Skyline Drive Scenic Backway because the Project would be designed to span the scenic backway, so permanent infrastructure would not be located directly on the scenic backway. Past and present actions in the area traversed by the scenic backway include oil and/or gas leases in the BLM Richfield Field Office and Millers Flat vegetation maintenance actions. RFFAs proposed or planned in the area traversed by the scenic backway include the TransWest Express Transmission Project and UDWR watershed restoration focus areas. The short-term cumulative effects of the Project crossing the scenic backway, in addition to past and present actions and RFFAs, would be increased traffic, potential delays for users and/or detours during construction actions. The long-term cumulative effects would be increased industrialization along the scenic backway. Cumulative effects for the scenic backway also are discussed in Section 4.3.16.

Wedge Overlook/Buckhorn Draw Scenic Backway

The Project would not contribute incrementally to cumulative effects on the Wedge Overlook/Buckhorn Draw Scenic Backway because the Project would be designed to span the scenic backway, so permanent infrastructure would not be located directly on the scenic byway. Past and present actions in the area traversed by the scenic backway include the active SITLA-administered humic shale, metalliferous mineral, and oil and/or gas leases. RFFAs proposed or planned in the area traversed by the scenic backway include the TransWest Express Transmission Project and UDWR watershed restoration focus areas. The short-term cumulative effects of the Project crossing the scenic backway, in addition to past and present actions and RFFAs, would be increased traffic and potential delay to users and/or detours during the construction actions. The long-term cumulative effects would be increased industrialization along the scenic backway. Cumulative effects for the scenic backway are also discussed in Section 4.3.16.

Labyrinth Canyon Special Recreation Management Area

The Project would not contribute incrementally to cumulative effects on the Labyrinth Canyon SRMA. Past and present actions in the SRMA include the Enterprise Products Partners and Williams Companies pipelines; the Atlas to Moab 69kV, Book Cliffs to Moab 69kV, Moab to Hitch 138kV, Mounds to Moab 138kV, and the Huntington to Pinto 345kV transmission lines; active SITLA-administered metalliferous mineral and oil and/or gas leases; and secondary roads. RFFAs proposed or planned in the SRMA include the TransWest Express Transmission Project. The short-term cumulative effects of the Project, past and present actions, and RFFAs would be potentially limiting and/or hindering access to and/or in the SRMA and an increase of noise during construction actions. The long-term cumulative effects would be additional industrial development in the SRMA, potentially limiting some recreational opportunities.

Labyrinth Rim and Gemini Bridges Special Recreation Management Area

The Project would not contribute incrementally to cumulative effects on the Labyrinth Canyon and Gemini Bridges SRMA. Past and present actions in the SRMA include oil and/or gas leases in the BLM Moab Field Office and active SITLA metalliferous mineral, oil and/or gas, and potash leases; and secondary roads. RFFAs proposed or planned in the SRMA include the TransWest Express Transmission Project, the Grand County Arches Overlook, and UDWR watershed restoration focus areas. The short-term cumulative effects of the Project, past and present actions, and RFFAs would be potentially limiting and/or hindering access to and/or in the SRMA and an increase of noise during construction actions. The

long-term cumulative effects would be additional industrial development in the SRMA, potentially limiting some recreational opportunities.

San Rafael Swell Special Recreation Management Area

The Project would not contribute incrementally to cumulative effects on the San Rafael SRMA. Past and present actions in the SRMA include the Huntington to Pinto 345kV transmission line, historic wild fire activity from 2000 to 2011, active SITLA-administered building stone, metalliferous mineral, oil and/or gas leases; and secondary roads. RFFAs proposed or planned in the SRMA include the TransWest Express Transmission Project, a potential wind farm location, and UDWR watershed restoration focus areas. The short-term cumulative effects of the Project, past and present actions, and RFFAs potentially would limit and/or hinder access to and/or in the SRMA and an increase of noise during construction actions. The long-term cumulative effects would be additional industrial development in the SRMA, potentially limiting some recreational opportunities.

4.2.11.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Past and present actions and RFFAs located in parks, preservation, and recreation resource areas also are crossed by alternative routes considered in the COUT route grouping are presented in Table 4-117, and the potential cumulative effects are discussed by parks, preservation, and recreation resource below.

Effects

Nephi Shooting Range

The Project would not contribute incrementally to cumulative effects on Nephi Shooting Range because the Project would be designed to span the site, so permanent infrastructure would not affect the site. Past and present actions that occur in the Nephi Shooting Range include the Fountain Green to Nebo 46kV transmission line. There are no RFFAs in the Nephi Shooting Range. The short-term cumulative effects of the Project crossing the Nephi Shooting Range in addition to the past and present actions would be limited access and operations of the shooting range during construction of the Project. The long-term effects on the Nephi Shooting Range would not be anticipated.

Private Motor-cross Track

The Project would not contribute incrementally to cumulative effects on a private motor-cross track because the Project would be designed to span the track, so permanent infrastructure would not affect the track. Past and present actions in the track include Uinta-Wasatch-Cache National Forest fencing. RFFAs proposed or planned include the UDWR watershed restoration focus areas. The short-term cumulative effects of the Project where it crosses the motor-cross track, in addition to the past and present actions, and RFFAs would be limiting access to the track during construction. Long-term cumulative effects on the private motor-cross track are not anticipated.

Snow Kite Play Areas

The Project would not contribute incrementally to cumulative effects on the snow-kite play areas because the Project would be located in an area where other past and present actions are located. Past and present actions in the snow-kite play area include secondary roads. There are no RFFAs proposed or planned in the snow-kite play area. The short-term cumulative effects of the Project crossing the snow-kite play area in addition to the past and present actions would be minimal because construction actions would likely not occur in the area during the play area's peak use (winter). Long-term effects would be limited access to portions of the snow-kite play areas and an increased potential for user conflicts with above ground facilities associated with the proposed transmission facilities.

TABLE 4-117 PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES									
Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Multi-State									
Dinosaur Diamond Scenic Byway ²	U.S. Department of Transportation Federal Highway Administration	COUT-A, COUT-A	6	1	2	2	5	1	–
		COUT-B and route variations	11	1	6	2	9	2	–
		COUT-C and route variations	3	1	0	1	2	1	–
		COUT-H	7	1	4	1	6	1	–
		COUT-I	6	1	0	3	4	2	–
Colorado									
There are no parks, preservation, or recreation resources crossed by the COUT BAX alternative routes in Colorado.									
Utah									
Private All-terrain Vehicle/Motor-cross Track	Private	COUT-B and COUT-C and route variations, COUT-I	71	71	0	0 ¹	71	0	0.0
Snow Kite Play Areas	Sanpete County	COUT-H	723	710	0	0 ¹	710	13	0.0
Nephi Shooting Range	City of Nephi	COUT-A, COUT-B, and COUT-C and route variations; COUT-H, COUT-I	37	37	0	0 ¹	37	0	0.0
Nine Mile Canyon Backway ²	U.S. Department of Transportation, Federal Highway Administration	COUT-C and route variations, COUT-H	3	0	3	0 ¹	3	0	–
		COUT-I	6	0	3	2	5	1	–

TABLE 4-117 PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES									
Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Indian Canyon Scenic Byway ²	U.S. Department of Transportation, Federal Highway Administration	COUT-B and COUT-C and route variations, except COUT-B-1, COUT-C-1	3	0	1	1	2	1	–
		COUT-B-1, COUT-C-1	13	2	0	7	9	4	–
		COUT-H	20	2	18	0 ¹	20	0	–
Reservation Ridge Scenic Backway ²	State of Utah	COUT-B-1, COUT-C-1	82	4	67	4	75	7	–
		COUT-B-2, COUT-B-4, COUT-C-2, COUT-C-4	37	1	32	0 ¹	33	4	–
Skyline Drive Scenic Backway ²	Manti-La Sal National Forest	COUT-I	3	1	2	0 ¹	3	0	–
Energy Loop Scenic Byway ²	Manti-La Sal National Forest	COUT-B, COUT-C, COUT-I	4	0	3	0 ¹	3	1	–
		COUT-H	24	7	12	3	22	2	–
White River/ Strawberry Road Scenic Backway ²	Uinta-Wasatch-Cache National Forest	COUT-A	6	1	2	1	4	2	–
		COUT-A-1	10	1	0	5	6	4	–
Blind Canyon Trail ²	Manti-La Sal National Forest	COUT-A, COUT-B, and COUT-C and route variations	3	0	0	2	2	1	–
French Hollow Trail ²	Uinta-Wasatch-Cache National Forest	COUT-A and route variation	4	0	0	3	3	1	–
Maple Fork Trail ²	Manti-La Sal National Forest	COUT-H	3	0	0	2	2	1	–
Quitchampau Trail ²	Ashley National Forest	COUT-B and route variations	4	1	3	0	4	0	–

TABLE 4-117 PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES									
Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Willow Creek South Trail ²	Uinta-Wasatch-Cache National Forest	COUT-A and route variation	3	0	2	1	3	0	–
Booths Canyon Trail ²	Manti-La Sal National Forest	COUT-I	3	3	0	0	3	0	–
Semi-Primitive Non-Motorized Recreation Opportunity Spectrum	Bureau of Land Management (BLM) Price Field Office	COUT-C, COUT-H, COUT-I	6,492	21	40	0	61	6,431	0.0
		COUT-C-4		21	40	51	112	6,380	0.8
		COUT-C-5		21	40	49	110	6,382	0.8
Motorized Trails ^{2, 3}	BLM/U.S. Forest Service	COUT-A	30	5	10	10	25	5	–
		COUT-A-1	27	3	7	11	21	6	–
		COUT-B and route variations, except COUT-B-1	12	4	8	0	12	0	–
		COUT-B-1	21	5	16	0	21	0	–
Motorized Trails ^{2, 3}	BLM/U.S. Forest Service	COUT-C and route variations, except COUT-C-1	10	0	5	4	9	1	–
		COUT-C-1	20	1	13	4	18	2	–
		COUT-H	71	5	50	11	66	5	–
		COUT-I	18	0	5	9	14	4	–
NOTES: ¹ Zero in Incremental Project Development indicates the alternative route and associated right-of-way overlaps past and present actions. ² Because of the length of the linear preservation and recreation features, cumulative effects on linear features are limited to the cumulative impact analysis area (CIAA). The percent of Incremental Project Development is reported for these features only in the CIAA. ³ Due to the number of motorized trails located in the CIAA, motorized trails were not analyzed individually. Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.									

Blind Canyon Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on Blind Canyon Non-motorized Trail because the Project would be designed to span the non-motorized trail, so permanent infrastructure would not affect the non-motorized trail. There are no past and present in the area traversed by the Blind Canyon Non-Motorized trail. RFFAs planned in the area traversed by the non-motorized trail include a UDWR watershed restoration focus area. The short-term cumulative effects of the Project crossing the non-motorized trail would be potentially limiting access to the trail during construction actions. Long-term cumulative effects on the Blind Canyon Non-motorized trail are not anticipated.

Booths Canyon Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on Booths Canyon Non-motorized Trail because the Project would be designed to span the non-motorized trail, so permanent infrastructure would not affect the non-motorized trail. Past and present actions that occur in the area traversed by the non-motorized trail include oil and/or gas leases in the BLM Richfield Field Office and Millers Flat vegetation management maintenance actions. A RFFA planned in the area traversed by the non-motorized trail would be a UDWR watershed restoration focus area. The short-term cumulative effects of the Project crossing the non-motorized trail in addition to the past and present actions and a RFFA would be limiting the access to the trail during construction actions. The long-term effects on the Booths Canyon Non-motorized Trail would not be anticipated.

French Hollow Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on French Hollow Non-motorized Trail because the Project would be designed to span the non-motorized trail, so permanent infrastructure would not affect the non-motorized trail. There are no past and present actions or RFFAs in the area traversed by the non-motorized trail. The cumulative effects of the Project crossing the trail would be same as direct and indirect impacts described in Section 3.2.11 and Section 3.2.16.

Maple Fork Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on Maple Fork Non-motorized Trail because the Project would be designed to span the non-motorized trail, so permanent infrastructure would not affect the non-motorized trail. There are no past and present actions or RFFAs in the area traversed by the Maple Fork Non-motorized Trail. The cumulative effects of the Project crossing the non-motorized trail would be same as direct and indirect impacts described in Section 3.2.11.

Quitchampau Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on Quitchampau Non-motorized Trail because the Project would be designed to span the non-motorized trail, so permanent infrastructure would not affect the non-motorized trail. Past and present actions in the area traversed by the non-motorized trail include the Berry Petroleum South Unit oil and/or gas project and the Upalco to Panther 138kV transmission line. RFFAs proposed or planned in the area traversed by the non-motorized trail include the TransWest Express Transmission Project and UDWR watershed restoration focus areas. The short-term cumulative effects of the projects crossing the non-motorized trail would include potentially limiting access to the trail during construction actions. Long-term cumulative effects on the Quitchampau Non-motorized Trail are not anticipated.

Willow Creek South Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on Willow Creek South Non-motorized Trail because the Project would be designed to span the non-motorized trail, so permanent

infrastructure would not affect the non-motorized trail. Past and present actions that occur in the area traversed by the non-motorized trail include the Lake Canyon oil and/or gas project. The RFFA proposed in the area traversed by the non-motorized trail is the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the non-motorized trail in addition to past and present actions and a RFFA potentially would limit access to the trail during construction actions. Long-term cumulative effects on the Willow Creek South Non-motorized Trail are not anticipated.

Motorized Trails

The Project would not contribute incrementally to cumulative effects on motorized trails because the Project would be designed to span the trails, so permanent infrastructure would not be located directly on the trails past and present actions in the area traversed by the motorized trails include oil and/or gas leases in the BLM Price Field Office, Sheep Creek vegetation management, active SITLA oil and/or gas leases, the Wildcat Loadout project, and Uinta-Wasatch-Cache National Forest rangeland fences and gates. RFFAs proposed or planned in the area traversed by the motorized trails include the TransWest Express Transmission Project, and UDWR watershed restoration focus areas. The short-term cumulative effects of the Project crossing motorized trails in addition to the past and present actions and RFFAs would be limited access for users to the trails during construction. Long-term cumulative effects on motorized trails would not be anticipated.

Dinosaur Diamond Scenic Byway

For Alternatives COUT-A, COUT-B, COUT-C, COUT-H, and COUT-I (including route variations), the Project would not contribute incrementally to cumulative effects on Dinosaur Diamond Scenic Byway because the Project would be designed to span the scenic byway, so permanent infrastructure would not be located directly on the scenic byway. Past and present actions in the area traversed by the scenic byway include the active SITLA-administered oil and/or gas leases, historic wildfires from 2000 to 2011, and range improvements in the BLM White River Field Office. RFFAs proposed or planned in the area traversed by the scenic byway include the TransWest Express Transmission Project, Victory Pipeline, and UDWR watershed restoration focus areas. The short-term cumulative effects of the Project crossing the scenic byway in addition to past and present actions and RFFAs would be increased traffic, potential delays for users and/or detours during construction actions. A long-term cumulative effect would be increased industrialization along the scenic byway. Cumulative effects for the scenic byway also are discussed in Section 4.3.16.

Energy Loop Scenic Byway

The Project would not contribute incrementally to cumulative effects on Energy Loop Scenic Byway because the Project would be designed to span the scenic byway, so permanent infrastructure would not be located directly on the scenic byway. There are no past and present actions on Alternatives COUT-B, COUT-C, and COUT-I. For Alternative COUT-H, past and present actions in the area traversed by the scenic byway include the Skyline Mine, oil and/or gas leases in the BLM Price Field Office, the Ferron Natural Gas Project, active SITLA-administered oil and/or gas leases, and a railroad line. RFFAs proposed or planned in the area traversed by the scenic byway include TransWest Express Transmission Project and UDWR watershed restoration focus areas. Short-term cumulative effects of the Project crossing the scenic byway, in addition to past and present actions and a RFFA, would be increased traffic, potential delays for users and/or detours during construction actions. Long-term cumulative effects would be increased industrialization along the scenic byway. Cumulative effects for the scenic byway also are discussed in Section 4.3.16.

Indian Canyon Scenic Byway

For Alternatives COUT-B (including route variations), COUT-H, and COUT-I, the Project would not contribute incrementally to cumulative effects on Indian Canyon Scenic Byway because the Project

would be designed to span the scenic byway, so permanent infrastructure would not be located directly on the scenic byway. There are no past and present actions on Alternative COUT-B (including all route variations except COUT-B-1) and Alternative COUT-C (including all alternative route variations except COUT-C-1). Past and present actions for Alternatives COUT-B-1, COUT-C-1, and COUT-H in the area traversed by the scenic byway include active SITLA-administered oil and/or gas leases. There are no RFFAs for Alternatives COUT-B-1 and COUT-C-1. For Alternatives COUT-B and COUT-C (including the remaining alternative route variations), and COUT-H, RFFAs proposed or planned in the area traversed by the scenic byway include the TransWest Express Transmission Project and UDWR watershed restoration focus areas. The short-term cumulative effects of the Project crossing the scenic byway in addition to past and present actions and RFFAs would be a potential for increased delays for users, and/or detours during construction actions. The long-term cumulative effects would be increased industrialization along the scenic byway. Cumulative effects for the scenic byway are also discussed in Section 4.3.16.

Nine Mile Canyon Backway

For Alternatives COUT-B (including route variations), COUT-H, and COUT-I, the Project would not contribute incrementally to cumulative effects on Nine Mile Canyon Scenic Backway because the Project would be designed to span the scenic backway, so permanent infrastructure would not be located directly on the scenic backway. Past and present actions in the area traversed by the scenic backway include the Gasco oil and/or gas development and the Carbon County ATV trail. RFFAs proposed or planned in the area traversed by the backway include the TransWest Express Transmission Project and UDWR watershed restoration focus areas. The short-term cumulative effects of the Project crossing the backway, in addition to past and present actions and RFFAs, would be increased traffic that would cause potential delay for users and/or detours during construction actions. The long-term cumulative effects would be increased industrialization along the backway. Cumulative effects for the scenic backway also are discussed in Section 4.3.16.

Reservation Ridge Scenic Backway

For Alternatives COUT-B and COUT-C (including route variations), the Project would not contribute incrementally to cumulative effects on Reservation Ridge Scenic Backway because the Project would be designed to span the scenic backway, so permanent infrastructure would not be located directly on the scenic backway. There are no past and present actions in the area traversed by the scenic backway. RFFAs proposed or planned in the area traversed by the scenic backway include the TransWest Express Transmission Project and UDWR watershed restoration focus areas. The short-term cumulative effects of the Project crossing the backway in addition to RFFAs would be increased traffic, potential delays for users, and/or detours during construction actions. The long-term cumulative effects would be increased industrialization along the backway.

Skyline Drive Scenic Backway

The Project would not contribute incrementally to cumulative effects on Skyline Drive Scenic Backway because the Project would be designed to span the scenic backway, so permanent infrastructure would not be located directly on the scenic backway. Past and present actions in the area traversed by the scenic backway include oil and gas leases in the BLM Richfield Field Office and Millers Flat vegetation maintenance actions. RFFAs proposed or planned in the area traversed by the scenic backway would be the TransWest Express Transmission Project and UDWR watershed restoration focus areas. The short-term cumulative effects of the Project crossing the backway, in addition to past and present actions and RFFAs, would be increased traffic and potential delays for users and/or detours during construction actions. The long-term cumulative effects would be increased industrialization along the backway. Cumulative effects for the scenic backway also are discussed in Section 4.3.16.

White River/Strawberry Road Scenic Backway

The Project would not contribute incrementally to cumulative effects on White River/Strawberry Road Scenic Backway because the Project would be designed to span the scenic backway, so permanent infrastructure would not be located directly on the scenic backway. A past and present action in the area traversed by the scenic backway would be the Mona to Bonanza 345kV transmission line. There are no RFFAs for Route Variation COUT-A-1 but for Alternative COUT-A, RFFAs proposed or planned in the area traversed by the scenic backway include the TransWest Express Transmission Project and UDWR watershed restoration focus areas. The short-term cumulative effects of the Project crossing the backway, in addition to the past and present action, would be a potential increase of traffic and delays for users and/or detours during construction actions. The long-term cumulative effects would be increased industrialization along the scenic backway.

Semi-Primitive Non-motorized Recreation Opportunity Spectrum Area

The Project would not contribute incrementally to cumulative effects on the Semi-Primitive Non-motorized ROS area in the Vernal Field Office. Past and present actions in this ROS classification include active SITLA-administered oil and/or gas leases. The RFFA proposed in this ROS classification would be the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing this ROS category, in addition to the past and present action and RFFA, potentially would be limited access to the ROS category and increased noise during construction actions. Long-term effects on the Semi-Primitive Non-motorized ROS area are not anticipated.

4.3.12 Transportation and Access

The approach for analysis of cumulative effects on transportation and access resources, including the geographic and temporal scopes defined for analysis, are presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.12.4.2) and considers them in conjunction with the past, present, and RFFAs listed in Tables 4-1 and 4-2. The major transportation network and features are illustrated on MV-17a and MV-17b.

4.3.12.1 Issues Identified for Analysis

Issues that have been identified in relation to transportation and access (refer to Section 3.2.12.2) include concerns that the towers possibly would interfere with airport and landing strip operations, that small county roads crossed by the project would need to be maintained and not blocked or changed from uses defined in county transportation plans, and that conflicts between transportation/access users and the Project would occur during construction and potentially during operations and maintenance of the Project.

4.3.12.2 Existing Condition

Roadways, such as interstates, highways (U.S. and state), and secondary roads are parallel to and crossed by the alternative routes. These roadways occur throughout the Project area. Generally, these roadways are identified as past and present activities, with many of the other past and present activities being accessed by the roadways.

Small aviation facilities occur throughout the Project area on public and privately owned lands. Most of the airports are located on the outskirts of their associated cities or towns with airstrips associated with rural development and agricultural livestock operations occurring in less populated areas. These aviation facilities are considered as past and present activities and are associated with other existing land uses.

Railroad lines occur throughout the Project area, with portions of the alternative routes in Wyoming and Utah paralleling the rail lines. Similar to roadways and aviation facilities, these railroad lines are considered as past and present activities with some of the railroads supporting operations of other past and present actions (i.e., railroads from coal sources to power plants).

4.3.12.3 Results

4.3.12.3.1 Roadways

Potential environmental effects discussed in Section 3.2.12.4.2 form the basis for cumulative effects of the Project and RFFAs on the environment discussed below.

Effects

Existing roadways would be used to the extent practical to provide access for the Project and RFFAs (as identified in Table 4-1). There would be the potential that existing roadways could be used simultaneously by the Project and RFFAs, increasing the use of the roadways beyond localized use. Increased traffic on these existing roadways to access the Project and RFFAs would require increased maintenance, and temporary road closures/delays and detours during construction.

Where access to the Project and other RFFAs cannot be gained using existing roadways, new access and/or improved access would occur. In some instances new access and improved access would be used by the Project and RFFAs; however, the practicality of this is not known because the Project typically requires access to all its on-the-ground components (i.e., transmission structures, communication facilities, and series compensation stations) for construction, operation, and maintenance. Even though new access developed and existing access improved by the Project and RFFAs would be closed to the public, the potential for unauthorized users to access areas previously inaccessible could result in requirements for additional agency administrative considerations such as law enforcement, maintenance and associated costs, and emergency response.

4.3.12.3.2 Aviation Facilities

Aviation facilities potential environmental effects discussed in Section 3.2.12.4.2 form the basis for effects of the Project and RFFAs on the environment discussed below.

Effects

Construction of the Project and RFFAs (refer to Table 4-2) with above-ground components such as the TransWest Express Transmission Project, would be constructed considering requirements associated with existing aviation-facility operations. The addition of the Project and RFFAs also could increase safety concerns associated with operation of aviation facilities. The implementation of the Project and RFFAs also could result in limiting the expansion of these aviation facilities in the future.

4.3.12.3.3 Railroads

Railroads potential environmental effects discussed in Section 3.2.12.4.2 form the basis for effects of the Project and RFFAs on the environment discussed below.

Effects

Railroads would be crossed by the Project and some RFFAs (other linear RFFAs are included in Table 4-1). Operations of the railroads would be altered during construction and safety concerns would be increased with the location of the Project and RFFAs near the railroads such as a clearance issues and railroad set-back issues due to limited space. Implementation of the Project and RFFAs also could limit the ability of the railroads to expand/or reroute, should the need arise in the future.

4.3.13 Special Designation and Other Management Areas

The approach for analysis of cumulative effects on special designation and other management areas including the geographic and temporal scopes defined for analysis is presented in Table 4-3. This analysis relies on the results of direct and indirect impacts from the Project (refer to Section 3.2.13) and considers them in conjunction with the past, present, RFFAs listed in Tables 4-1 and 4-2.

4.3.13.1 Issues Identified for Analysis

The following issue that has been identified related to the special designations and other management areas section.

4.3.13.1.1 Potential Impacts on Special Designations and Other Management Areas

Potential conflicts include crossing conservation easements that prohibit future transmission lines from crossing them and crossing special designations that are exclusion or avoidance areas for future utility development. These impacts would be intensified where other existing actions have already affected a special designation and/or other management area or a RFFA is proposed in the same area. Whether the Project is compounding an existing or RFFA, the cumulative effect on the reason for the designation of a special designation and/or other management area may result in the area not being managed for what it was originally intended.

4.3.13.2 Existing Condition

Past and present actions generally occur on almost all special designation and other management areas in the geographic scope. The natural environment has been altered in a way that allows for past and present actions such as recreational infrastructure, oil and/or gas development, roads, pipelines, transmission lines, etc., but is still compatible with the natural feature for which the special designation or other management area was designated.

Past and present actions do not occur on some special designation and other management areas in the geographic scope. These areas are being protected for natural and undisturbed conditions. This would include some conservation easements, wildlife management areas, and URMCC-managed lands.

4.3.13.3 Results

4.3.13.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Past and present actions and RFFAs located in special designations and other management areas and are crossed by the WYCO route grouping are presented in Table 4-118. Discussion of the potential cumulative effects on special designations and other management areas are presented below.

Effects

The following summarizes the cumulative effects on special designations and other management areas that would be crossed by WYCO alternative routes (including alternative route variations), including what past and present actions and/or RFFAs that have or could occur in the boundary of these special designations or other management areas in addition to the Project.

Red Rim-Daley Wildlife Habitat Management Area

The percentage of the Project in the Red Rim-Daley WHMA would be less than 1 percent. Past and present actions occurring in the Red Rim-Daley WHMA include the Anadarko Atlantic Rim natural gas development, a uranium mining lease on Wyoming state land, prescribed burns completed by the BLM

Rawlins Field Office, and I-80 with additional secondary roads (county and access roads). RFFAs proposed or planned in the Red Rim-Daley WHMA include two high-voltage transmission lines (TransWest Express and Gateway West transmission projects), the Hogback Ridge Wind Farm (formerly the Whirlwind I wind farm), and the BP Continental Divide-Creston Junction natural gas development. The short-term cumulative effects of the Project in addition to past and present actions, and other RFFAs proposed in this area would be increased noise from construction equipment, limited access to a portion of the WHMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects would include additional industrial development in the WHMA, which potentially would limit management actions associated with pronghorns and raptors in the WHMA.

Upper Muddy Creek Watershed/Grizzly Wildlife Habitat Management Area

The percentage of the Project in the Upper Muddy Creek Watershed/Grizzly WHMA would be less than 1 percent. Past and present actions that occur in the Upper Muddy Creek Watershed/Grizzly WHMA include the Anadarko Atlantic Rim natural gas development, the Power Company of Wyoming's Sierra Madre wind farm, prescribed burns completed by the Rawlins Field Office, Wyoming Highway 789, and additional secondary roads (access roads). RFFAs proposed or planned in the Upper Muddy Creek Watershed/Grizzly WHMA include the BP Continental Divide – Creston Junction natural gas development and TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and other RFFAs proposed in this area would be increased noise from construction equipment, limited access to a portion of the WHMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects would include additional industrial development in the WHMA, which potentially would limit management actions associated with fish habitat in the Muddy Creek watershed and elk and mule deer in the WHMA.

Adobe Town Wild Horse Herd Management Area

The percentage of the Project in the Adobe Town WHHMA would be less than 1 percent. Past and present actions in the Adobe Town WHHMA include oil and/or gas leases on Wyoming state land and prescribed burns completed by the Rawlins Field Office. RFFAs proposed or planned in Adobe Town WHHMA include the BP Continental Divide – Creston Junction natural gas development, Hiawatha Regional Energy Development oil and/or gas development, and TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and other RFFAs proposed in this area would be increased noise from construction equipment, limited access to a portion of the WHHMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on management actions in the WHMA are not anticipated.

Moffat County Road #11 Land and Water Conservation Fund Site

The percentage of the Project in the Moffat County #11 LWCF site would be zero percent because the Project would span the site, resulting in no permanent infrastructure located on the site. Past and present actions on the LWCF site include oil and/or gas lease activity on Colorado state land. RFFAs proposed on the LWCF site include the TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and RFFAs proposed in this area would include increased noise from construction equipment, increased traffic, and potential delays for users and/or detours during construction actions. Long-term cumulative effects on management actions of this LWCF site are not anticipated.

TABLE 4-118 SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES										
Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming										
Red Rim-Daley Wildlife Habitat Management Area (WHMA)	Wyoming Game and Fish Department	Crucial winter habitat for pronghorn and nesting habitat for raptors	All WYCO alternative routes and route variations	11,100	1,347	514	47	1,909	24,082	0.400
Upper Muddy Creek Watershed/ Grizzly WHMA	Bureau of Land Management Rawlins Field Office/ Wyoming Game and Fish Department	Habitat for Colorado River fish species unique to Muddy Creek watershed and crucial winter habitat for elk and mule deer	WYCO-D and route variation	59,720	13,293	506	8	13,807	45,976	0.010
Adobe Town Wild Horse Herd Management Area	Bureau of Land Management Rawlins Field Office	To provide a protected area for up to 812 wild horses after foaling season	WYCO-B and route variations	472,812	7,289	1,166	216	8,671	468,953	0.050
			WYCO-C and route variations		7,289	1,166	129	8,584	469,040	0.030
			WYCO-F and route variations		7,289	1,166	9	8,464	469,160	0.002
			WYCO-F and route variations		2,459	948	22	3,428	17,128	0.110

TABLE 4-118 SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES										
Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Utah										
Moffat County Road #11 Land and Water Conservation Fund site	Moffat County, National Park Service (NPS)	Funding provided by NPS to construct the road	WYCO-D and route variation	590	38	3	1	42	548	0.000 ³
Yampa River Recreation Area Land and Water Conservation Fund site	Moffat County, NPS	Funding provided by NPS to develop a recreation area	All WYCO alternative routes and route variations	3,781	932	11	2	945	2,836	0.000 ³
Bitterbrush State Wildlife Area	Colorado Parks and Wildlife	Provides hunters and wildlife viewers opportunities to see mule deer, elk, and pronghorn	WYCO-D and route variation	8,057	450	104	0	554	7,525	0.000
Deerlodge Road entrance to Dinosaur National Monument	NPS	Provides the entrance to Dinosaur National Monument	WYCO-B-2, WYCO-C-2, WYCO-F-2	6732	101	5	1	107	565	0.100

TABLE 4-118 SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES										
Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Tuttle Ranch Conservation Easement	Colorado Parks and Wildlife	To protect white-tailed prairie dog complex by allowing the reintroduction of black-footed ferrets and conservation of sage-grouse leks	WYCO-B-1, WYCO-C-1, WYCO-F-1	15,000	2,929	155	43	3,128	12,019	0.300
			All other WYCO-B, WYCO-C, and WYCO-F alternative routes and route variations		2,929	155	0	3,085	12,061	0.000
NOTES: ¹ The zero signifies the Project right-of-way is overlapping with past and present or reasonably foreseeable future actions and is included in the acreage of the past and present actions or reasonably foreseeable future actions column(s), as appropriate. ² The size only pertains to Deerlodge Road and not the entire Dinosaur National Monument. ³ Area will be spanned resulting in zero percent disturbance Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.										

Yampa River Recreation Area Land and Water Conservation Fund Site

The percentage of the Project in the Yampa River Recreation Area LWCF site would be zero percent because the Project would span the site, so no permanent infrastructure would affect the site. Past and present actions on the LWCF site include oil and/or gas lease activity on Colorado state land and the BLM Little Snake Field Office, Hayden to Artesia 138kV transmission line, the Bears Ears to Bonanza 345kV transmission line, two railroad lines, and Colorado State Highway 13. The RFFA proposed on the site would be the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the LWCF site in addition to the past and present and the RFFA occurring on the LWCF site potentially would limit and/or hinder access and increase noise during construction of the projects. The long-term cumulative effects would be the presence of an additional transmission line spanning LWCF site.

Bitterbrush State Wildlife Area

The percentage of the Project in the Bitterbrush SWA would be zero percent because the Project right-of-way is located in an area that has past and present actions and an RFFA. Past and present actions that occur in the Bitterbrush SWA include pipelines and secondary roads (e.g., access roads, etc.). The RFFA proposed in the SWA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would be increased noise from construction equipment, limited access to a portion of the SWA during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects on management actions in the SWA are not anticipated.

Deerlodge Road Entrance to Dinosaur National Monument

The percentage of the Project in the Deerlodge Road entrance to Dinosaur National Monument would be less than 1 percent. In addition, the Project would span the site, so no permanent infrastructure would affect the site. Past and present actions that occur in the area traversed by Deerlodge Road include oil and/or gas lease activity on Colorado state land and prescribed fires and range improvements completed by the White River Field Office. The RFFA proposed for Deerlodge Road is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would be increased noise from construction equipment, increased traffic, potential delays for users, and/or detours during construction actions. The long-term cumulative effects would be increased industrialization along Deerlodge Road. Cumulative effects for Deerlodge Road are also discussed in Section 4.3.16.

Tuttle Ranch Conservation Easement

The percentage of the Project in the Tuttle Ranch Conservation Easement would be less than 1 percent. Past and present actions that occur in the Tuttle Ranch Conservation Easement include oil and/or gas leases in the BLM Little Snake Field Office and on Colorado state lands, range improvement projects completed by the White River Field Office, Bears Ears to Bonanza 345kV transmission line, Hayden to Artesia 138kV transmission line, and secondary roads (access roads, etc.). The RFFA proposed for Tuttle Ranch Conservation Easement is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would be increased noise from construction equipment, limited access to a portion of the conservation easement during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects would include additional industrial development in the conservation easement (which goes against the terms of the conservation easement).

4.3.13.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Past and present actions and RFFAs located in special designations and other management areas and are crossed by the COUT BAX route grouping are presented in Table 4-119. Discussion of the potential cumulative effects on special designations and other management areas are presented below.

Effects

Piceance/East Douglas Wild Horse Herd Management Area

The percentage of the Project in the Piceance/East Douglas WHHMA would be less than 1 percent. Past and present actions in the WHHMA include oil and/or gas leases, vegetation treatments, and range improvement projects managed and prescribed by the BLM White River Field Office, and the Shell Frontier Oil and Gas, Incorporated Oil Shale Research, Development, and Demonstration Project. The RFFA proposed in the WHHMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and other RFFAs proposed in this area would be increased noise from construction equipment, limited access to a portion of the WHHMA during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects on management actions in the WHHMA are not anticipated.

Big Hole Rock Art Site Area of Critical Environmental Concern

The percentage of the Project located in the Big Hole Rock Art Site ACEC would be less than 1 percent but the Project would span the ACEC, so no permanent infrastructure would affect the ACEC. There is one existing 345kV line (Huntington to Pinto) and no RFFAs that occur in the ACEC. The cumulative effects of the Project crossing the ACEC would be same as direct and indirect impacts described in Section 3.3.13 and Section 3.2.18.

North Moroni Conservation Easement

The percentage of the Project in the North Moroni Conservation Easement would be less than 1 percent. Past and present actions that occur in the North Moroni Conservation Easement include active oil and/or gas leases on SITLA-managed land and secondary roads (as, etc.). The RFFA proposed for North Moroni Conservation Easement is the TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would include increased noise from construction equipment, limited access to a portion of the conservation easement during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects would include additional industrial development in the conservation easement.

Fountain Green Wildlife Management Area

The percentage of the Project in the Fountain Green WMA would be less than 1 percent. Past and present actions that occur in the WMA include active oil and/or gas leases on SITLA-managed land. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would be increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long term cumulative effects on management actions in the WMA are not anticipated.

TABLE 4-119 SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES										
Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Colorado										
Piceance/East Douglas Wild Horse Herd Management Area	Bureau of Land Management (BLM) White River Field Office	To provide habitat for between 135 and 235 wild horses	All COUT BAX alternative routes	190,130	20,293	25	11	20,328	169,507	0.006
Utah										
Big Hole Rock Art Site Area of Critical Environmental Concern	BLM Price Field Office	To protect Big Hole Rock Art site	COUT BAX-B	650	6	0	4	10	639	0.600
North Moroni Conservation Easement	Utah Division of Wildlife Resources (UDWR)	To protect crucial deer and elk winter range	COUT BAX-B, COUT BAX-C	1,100	120	17	9	146	1,059	0.800
Fountain Green Wildlife Management Area (WMA)	Utah Reclamation Mitigation and Conservation Commission (URMCC) and UDWR	To reserve forage for big game so to prevent them from feeding on adjacent farms and to improve upland game habitat.	COUT BAX-B, COUT BAX-C	2,445	1,254	6	1	1,260	1,184	0.040

TABLE 4-119 SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES										
Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Gordon Creek WMA	UDWR	To protect critical big game winter range	COUT BAX-E	22,600	1,774	272	0 ¹	2,046	17,045	0.000
Salt Creek WMA	URMCC and UDWR	To protect important nesting, resting, and feeding habitat for waterfowl	All COUT BAX alternative routes	5,254	845	10	5	860	1,218	0.100
NOTES: ¹ The zero signifies the Project right-of-way is overlapping with past and present or reasonably foreseeable future actions and is included in the acreage of the past and present actions or reasonably foreseeable future actions column(s), as appropriate. Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.										

Gordon Creek Wildlife Management Area

The percentage of the Project in the Gordon Creek WMA would be zero percent because the Project right-of-way is located in an area that has past and present actions and an RFFA. Past and present actions that occur in the WMA include active oil and/or gas leases managed by BLM Price Field Office and SITLA. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would be increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on big game management actions in the WMA are not anticipated.

Salt Creek Wildlife Management Area

The percentage of the Project in the Salt Creek WMA would be less than 1 percent. Past and present actions that occur in the WMA include active oil and/or gas leases on SITLA-managed lands. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would be increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on waterfowl management actions in the WMA are not anticipated.

4.3.13.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Past, present, and RFFAs located in special designation and other management areas that are crossed by the COUT alternative routes and route variations are presented in Table 4-120. Discussion of the potential cumulative effects on special designations and other management areas are presented below.

Effects

Lower Green River Corridor Area of Critical Environmental Concern

The percentage of the Project in the Lower Green River Corridor ACEC would be less than 1 percent. This ACEC also includes a portion of the Lower Green River Suitable Wild and Scenic River (described below). Past and present actions that occur in the ACEC include gilsonite mining on the eastern side of the river, active oil and/or gas and metalliferous mineral leases on SITLA-managed lands, the Gasco Energy, Inc. Uinta natural gas development, the Bill Barrett Corporation West Tavaputs Plateau oil and/or gas development, and one existing Questar pipeline. RFFAs proposed or planned in the ACEC are TransWest Express Transmission Project and Newfield's Monument Butte oil and/or gas development. The short-term cumulative effects of the Project in addition to past and present actions, and RFFAs proposed in this area would be increased noise from construction equipment and limited access to a portion of the ACEC during construction actions of the projects. Long-term cumulative effects on the management of riparian habitat in this ACEC are not anticipated. Cumulative effects for Lower Green River Corridor ACEC regarding scenery are discussed in Section 4.3.16.

Lower Green River Suitable Wild and Scenic River Segment

The percentage of the Project in the Lower Green River Suitable WSR would be zero percent because the Project right-of-way is located in an area that has past and present actions and RFFAs. In addition, the Project would span the suitable WSR, so no permanent infrastructure would directly affect the suitable WSR. Past and present actions that occur in the suitable WSR include gilsonite mining on the eastern side of the river, active oil and/or gas and metalliferous mineral leases on SITLA-managed land, oil and/or gas leases managed by the BLM Vernal Field Office, XTO Energy's Riverbend Directional Infill oil and/or gas development, the Gasco Energy, Inc. Uinta natural gas development, the Bill Barrett Corporation West Tavaputs Plateau oil and/or gas development, and one existing Questar pipeline. RFFAs proposed or planned in the suitable WSR are the TransWest Express Transmission Project and Newfield's

Monument Butte oil and/or gas development. The short-term cumulative effects of the Project in addition to past and present actions, and RFFAs proposed in this area would be increased noise from construction equipment and the potential for limited access to a portion of the suitable WSR during construction actions of the projects in the Fourmile Bottom area. Long-term cumulative effects on the management of outstandingly remarkable value of recreation for this suitable WSR are not anticipated. Cumulative effects on Lower Green River suitable WSR regarding the scenic classification are discussed in Section 4.3.16.

North Moroni Conservation Easement

The percentage of the Project in the North Moroni Conservation Easement would be less than 1 percent. Past and present actions that occur in the North Moroni Conservation Easement include active oil and/or gas leases on SITLA-managed lands and secondary roads (access roads, etc.). The RFFA proposed for North Moroni Conservation Easement is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would be increased noise from construction equipment, limited access to a portion of the conservation easement during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects would include additional industrial development in the conservation easement.

Utah Reclamation Mitigation and Conservation Commission Lands

The percentage of the Project located on URMCC-managed lands would be less than 1 percent. There are no past and present actions or RFFAs that are directly related to these lands but past, present, and RFFAs are in the WMAs that these lands are associated with. See Currant Creek and Tabby Mountain WMAs below for cumulative effects related to the URMCC-managed lands.

Birdseye/Lake Fork Wildlife Management Areas

The percentage of the Project in the Birdseye/Lake Fork WMAs would be zero percent because the Project right-of-way is located in an area that has past, present, and RFFAs. Past and present actions that occur in the WMA include active oil and/or gas leases located on SITLA-administered land. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects on management actions for big game and the threatened Deseret milkvetch to the WMA to are not anticipated.

Cottonwood Canyon Wildlife Management Area

The percentage of the Project in the Cottonwood Canyon WMA would be zero percent because the Project right-of-way is located in an area that has past and present actions and an RFFA. Past and present actions that occur in the WMA include the Lake Canyon oil and/or gas project and oil leases on Utah state lands. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on management actions in the WMA to big game are not anticipated.

TABLE 4-120 SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES										
Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Colorado										
There are no special designations or other management areas crossed in Colorado for this route grouping.										
Utah										
Lower Green River Corridor Area of Critical Environmental Concern	Bureau of Land Management Vernal Field Office	To protect riparian habitat and scenery	COUT-C and route variations, COUT-H, COUT-I	9,347	689	41	1	731	8,616	0.01
Lower Green River Suitable Wild and Scenic River segment	Bureau of Land Management Vernal Field Office	Outstandingly remarkable values are recreation and fish with a tentative classification of scenic	COUT-C and route variations, COUT-H, COUT-I	11,968	735	32	0	767	11,201	0.00
North Moroni Conservation Easement	Utah Division of Wildlife Resources	To protect crucial deer and elk winter range	COUT-I	1,100	120	17	9	146	1,059	0.80

TABLE 4-120 SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES										
Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
The Utah Reclamation Mitigation and Conservation Commission (URMCC) Property (adjacent to: Tabby Mountain and Currant Creek Wildlife Management Areas [WMA])	URMCC	Acquired as mitigation for the Central Utah Project (a water development project)	COUT-A and route variation	16,550	1,377	80	36	1,493	15,057	0.20
Birdseye/Lake Fork WMA	UDWR	To protect big game winter range and threatened Deseret milkvetch populations	COUT-A, COUT-B, and COUT-C and route variations	3,750	34	118	19	171	828	0.50
Cottonwood WMA	UDWR	To protect big game winter range and to increase public access in an area of predominately private land	COUT-B and route variations	6,700	238	44	0	282	6,466	0.00

TABLE 4-120 SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES										
Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Currant Creek WMA	UDWR	Acquired as mitigation for wildlife habitat loss for the Central Utah Project, has angler access and aquatic/terrestrial habitat protection	COUT-A and route variation	21,400	1,797	109	40	1,946	19,457	0.20
Dairy Fork WMA	UDWR	To protect and enhance mule deer and elk winter range	COUT-A and route variations	4,900	112	79	18	208	4,868	0.40
			COUT-B and COUT-C and route variations				33	224	4,854	0.70
Fountain Green WMA	URMCC and UDWR	To reserve forage for big game so to prevent them from feeding on adjacent farms and to improve upland game habitat.	COUT-I	360	2,813	6	1	2,819	1,184	0.30
Gordon Creek WMA	UDWR	To protect critical big game winter range	COUT-H	22,600	1,774	272	0	2,046	17,045	0.00

TABLE 4-120 SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES										
Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Rabbit Gulch WMA	UDWR	To protect important nesting, resting, and feeding habitat for waterfowl	COUT-A and route variations	9,407	2,050	103	58	2,210	6,983	0.60
Salt Creek WMA	URMCC and UDWR	To protect critical big game winter range	All COUT alternative routes and route variations	5,254	845	10	5	860	1,218	0.10
Spencer Fork WMA	UDWR	To protect big game winter range	COUT-A, COUT-B, and COUT-C and route variations	6,500	3,932	237	80	4,248	3,657	1.20
Starvation WMA	UDWR	To protect and enhance mule deer and elk winter range	COUT-B, COUT-C and route variations	5,700	287	23	0	310	7,778	0.00
Tabby Mountain WMA	URMCC and UDWR	To protect critical winter range for big game	COUT-A and route variation	51,432	1,237	125	10	1,408	6,718	0.02
NOTES: ¹ The zero signifies the Project right-of-way is overlapping with past and present or reasonably foreseeable future actions and is included in the acreage of the past and present actions or reasonably foreseeable future actions column(s), as appropriate. Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.										

Currant Creek Wildlife Management Area

The percentage of the Project in the Currant Creek WMA would be less than 1 percent. Past and present actions that occur in the WMA include the Bill Barrett Lake Canyon Oil and/or Gas Project and vegetation treatments in the BLM Vernal Field Office. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects on management actions in the WMA are not anticipated.

Dairy Fork Wildlife Management Area

The percentage of the Project in the Dairy Fork WMA would be less than 1 percent. There are no past and present actions that occur in the WMA. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to an RFFA proposed in this area would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on management actions in the WMA for elk and mule deer are not anticipated.

Fountain Green Wildlife Management Area

The percentage of the Project in the Fountain Green WMA would be less than 1 percent. Past and present actions that occur in the WMA include active oil and/or gas leases on SITLA-managed lands. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects on management actions in the WMA are not anticipated.

Gordon Creek Wildlife Management Area

The percentage of the Project in the Gordon Creek WMA would be zero percent because the Project right-of-way is located in an area that has past and present actions and an RFFA. Past and present actions that occur in the WMA include active oil and/or gas leases managed by BLM Price Field Office and SITLA. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on big game management actions in the WMA are not anticipated.

Rabbit Gulch Wildlife Management Area

The percentage of the Project in the Rabbit Gulch WMA would be less than 1 percent. Past and present actions that occur in the WMA include active oil and/or gas development and oil development on Utah state land. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects on big game management actions in the WMA are not anticipated.

Salt Creek Wildlife Management Area

The percentage of the Project in the Salt Creek WMA would be less than 1 percent. Past and present actions that occur in the WMA include active oil and/or gas leases on SITLA-managed lands. The RFFA

proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on waterfowl management actions in the WMA are not anticipated.

Spencer Fork Wildlife Management Area

The percentage of the Project in the Spencer Fork WMA would be approximately 1 percent. There are no past and present actions that occur in the WMA. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on big game management actions in the WMA are not anticipated.

Starvation Wildlife Management Area

The percentage of the Project in the Starvation WMA would be zero percent because the Project right-of-way is located in an area that has a past and present action and an RFFA. Past and present actions that occur in the WMA include Sheep Creek vegetation management. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project in addition to past and present actions, and an RFFA proposed in this area would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on management actions in the WMA to mule deer and elk habitat are not anticipated.

Tabby Mountain Wildlife Management Area

The percentage of the Project in the Tabby Mountain WMA would be less than 1 percent. Past and present actions that occur in the WMA include Bill Barrett Corporation Blacktail Ridge oil and/or gas development and habitat management actions managed by the BLM Vernal Field Office. RFFAs proposed or planned in the WMA are TransWest Express Transmission Project and Bill Barrett Corporation Blacktail Ridge 12-well oil and/or gas project. The short-term cumulative effects of the Project in addition to past and present actions, and RFFAs proposed or planned in this area would be increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on management actions in the WMA are not anticipated.

4.3.14 Wilderness Areas, Wilderness Study Areas, and Non-wilderness Study Area Lands with Wilderness Characteristics

The approach for analysis of cumulative effects on non-WSA lands with wilderness characteristics or natural areas, including the geographic and temporal scopes defined for analysis is presented in Table 4-3. The cumulative effects on wilderness areas and wilderness study areas are not discussed in this section because these areas are not affected directly by the Project. This analysis relies on the results of direct and indirect impacts from the Project (refer to Section 3.2.14) and considers them in conjunction with the past, present, reasonably foreseeable future developments listed in Tables 4-1 and 4-2.

4.3.14.1 Issues Identified for Analysis

The following issue was identified for analysis of cumulative effects on lands with wilderness characteristics in the CIAA.

- **What are the impacts on the wilderness characteristics or management of lands with wilderness characteristics?** Potential conflicts include noncompliance with management prescriptions established for lands with wilderness characteristics or adversely impacting the wilderness characteristics for which a land with wilderness characteristics was considered for future wilderness designation (e.g., disrupting the naturalness of the environment, etc.). These conflicts would be intensified where the Project and other future and/or existing activities are occurring in the same land with wilderness characteristics.

4.3.14.2 Existing Condition

Past and present actions occur on almost all lands with wilderness characteristics in the geographic scope. This includes lands with wilderness characteristics in the BLM Rawlins, Little Snake, Moab, and White River Field Offices. The natural environment has been altered in a way that allows for past and present actions such as recreational infrastructure, oil and/or gas development, roads, pipelines, transmission lines, etc., but is still compatible with the wilderness characteristics for which the lands with wilderness characteristics were inventoried.

4.3.14.3 Results

4.3.14.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Potential cumulative effects from past, present, and RFFAs located on non-WSA lands with wilderness characteristics, crossed by alternative routes considered in the WYCO route grouping, are summarized below by inventoried area.

Non-wilderness Study Area Lands with Wilderness Characteristics in the BLM Rawlins Field Office

Due to existing oil and gas development and areas leased for development, the BLM elected to manage non-WSA lands with wilderness characteristics for multiple-use because of valid existing lease rights; therefore, implementation of management actions to protect identified wilderness characteristics would be prohibited.

Non-wilderness Study Area Lands with Wilderness Characteristics in the BLM Little Snake Field Office

West Sevenmile

Wilderness characteristics for this inventoried area (refer to Section 3.2.14.5) have been minimally influenced by past and present development including historic uses, vegetation treatments conducted by the Little Snake Field Office, and potential oil and gas development on Colorado State Land Board leases. The introduction of the Project (Alternatives WYCO-B, WYCO-C, and WYCO-F) and the proposed TransWest Express Project would dominate the wilderness characteristics along the eastern portion of West Sevenmile; however the remaining area would be intact. Opportunities for solitude would be influenced further into the inventoried area by these projects due to their vertical prominence. Effects on the wilderness values could be reduced if the proposed transmission line projects were colocated, to the extent practicable, to consolidate modifications in the inventoried area.

Lower Little Snake

Wilderness characteristics for this inventoried area have been minimally influenced by past and present development including agricultural uses on private lands adjacent to the Little Snake River. The Project (Alternatives WYCO-B, WYCO-C, and WYCO-F) and the proposed TransWest Express Project would cross this area, influencing wilderness characteristics adjacent to the Little Snake River. However, effects on wilderness characteristics in the core of the Lower Little Snake area, northwest of the Little Snake River, would be limited due to topographic screening offered by Sevenmile Ridge. All route variations except WYCO-B-1, WYCO-C-1, and WYCO-F-1 would cross an approximate 300-foot-wide section that connects two larger portions of the area. The introduction of the Project and the development of the TransWest Express Project within the core of the Lower Little Snake Area would begin to dominate the wilderness area. The effects could be reduced by colocating the two transmission line projects across the connection of the two portions of the Lower Little Snake area.

Simsberry Draw

Wilderness characteristics for this inventoried area have been minimally influenced by past and present development including historic use, vegetation treatments conducted by the Little Snake Field Office, and potential oil and gas development on Colorado State Land Board leases. The introduction of the Project (Alternatives WYCO-B, WYCO-C, and WYCO-F) and the proposed TransWest Express Project would dominate these characteristics since the transmission line projects would bisect this inventoried area on Godiva Rim. Due the prominence of Godiva Rim, these projects would be skylined and further influence opportunities for solitude and primitive recreation in this area. Because the two proposed transmission line projects would bisect the area, the resulting areas would be less than the 5000-acre threshold for the management of non-WSA lands with wilderness characteristics.

4.3.14.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Potential cumulative effects from past, present, and RFFAs located on non-WSA lands with wilderness characteristics crossed by alternative routes in the COUT BAX route grouping are summarized below by inventoried area.

Lands with Wilderness Characteristics in BLM White River Field Office

Coal Ridge

Wilderness characteristics for the Coal Ridge area (refer to Section 3.2.14.5) have been minimally influenced by past and present development. The introduction of the Project (Alternatives COUT BAX-B, COUT-BAX-C, and COUT BAX-E) and the proposed TransWest Express Project would influence wilderness characteristics along the western edge of Coal Ridge. However, topographic screening offered by Coal Ridge would reduce the effects of the Project on the wilderness characteristics of the core area. Effects on these wilderness values could be further reduced if the proposed transmission line projects were colocated outside of the area or located where views from the core area of this inventoried area could be further screened by topography.

Gilsonite Hills

Wilderness characteristics for this inventoried area have been minimally influenced by past and present development including potential oil and gas development on the BLM White River Field Office leases adjacent to the area, as well as a series of pipelines that form the southern boundary and influence wilderness values in the area. The introduction of the Project (Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E) along the eastern edge of the Gilsonite Hills area would further influence and begin to dominate the wilderness characteristics of the area, while effects on the core of the area would be limited due to the topographic screening offered by the highly dissected terrain. The proposed TransWest Express Project would not traverse this inventoried area. Effects on the wilderness

values could be reduced if the Project was located east of Dragon Road rather than crossing the road twice and traversing the inventoried area.

Oil Spring Mountain Wilderness Study Area (addition)

Wilderness characteristics for the Oil Spring Mountain WSA addition have been minimally influenced by past and present development including potential oil and gas development on the BLM White River Field Office leases in the area. If developed, oil and gas activities could begin to dominate the wilderness characteristics of this area. The introduction of the Project (Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E) and the proposed TransWest Express Project along the western edge of this inventoried area would further influence and begin to dominate the wilderness characteristics of the area. Effects on these wilderness values could be reduced if the proposed transmission line projects were colocated and sited further to the west outside of the inventoried area.

Bluejay Creek

Wilderness characteristics for this inventoried area have been influenced by past and present development including oil and gas pads located at the end of cherry-stemmed roads and a series of pipelines which form the southern boundary of the area. The BLM White River Field Office has leased areas for oil and gas development adjacent to the northeast and southwest edges of the Bluejay Creek area. If developed, oil and gas activities could begin to dominate the local area. The introduction of the Project (Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E) and the proposed TransWest Express Project along the northwestern edge of this inventoried area would further influence and begin to dominate the wilderness characteristics of the area. Effects on these wilderness values could be reduced if the proposed transmission line projects were colocated and sited further to the northwest outside of the inventoried area.

Whiskey Canyon

Wilderness characteristics for this inventoried area have been influenced by past and present development that includes a series of pipelines which form the eastern boundary of the area and encroach on the boundary. The BLM White River Field Office has leased areas for oil and gas development adjacent to the northern and western edges of this inventoried area. If developed, oil and gas activities could influence the characteristics of the area. The introduction of the Project (Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E) along the western edge of this inventoried area would further influence and begin to dominate the wilderness characteristics of the area. The proposed TransWest Express Project would not traverse Whiskey Canyon. Effects on the wilderness values could be reduced if the Project was sited further to the west outside of the inventoried area.

Lands with Wilderness Characteristics in BLM Grand Junction Field Office

Spring Canyon

Wilderness characteristics for this inventoried area (refer to Section 3.2.14.5) have been influenced by past and present development that include a series of pipelines that form the western boundary of this area and a number of cherry-stemmed roads, which influence opportunities for solitude and primitive recreation even though the roads are not within the boundary of the inventoried area. The BLM Grand Junction Field Office has leased areas for oil and gas development on several parcels in Spring Canyon. If developed, oil and gas activities could influence the wilderness characteristics of the area. The introduction of the Project (Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E) and the proposed TransWest Express Project along the western edge of this inventoried area would further influence and begin to dominate wilderness values of the local area. Effects on these wilderness values could be reduced if the proposed transmission line projects were colocated and sited further to the west outside of this inventoried area.

Lands with Wilderness Characteristics in BLM Moab Field Office

Harley Dome

Wilderness characteristics for the Harley Dome area (refer to Section 3.2.14.5) have been minimally influenced by past and present development that includes I-70 adjacent to the southeastern boundary of the area and potential oil and gas development on Utah SITLA leases along the northern boundary. The introduction of the Project (Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E) and the proposed TransWest Express Project along the southeastern boundary of the area would further influence and begin to dominate the wilderness characteristics of the area. Due to limited screening opportunities, the influence of these projects would extend further into the core of the area. Effects on these wilderness values could be reduced if the proposed transmission line projects were colocated adjacent to I-70, which would increase impacts on views for motorists on this high-use highway.

Floy Canyon

Wilderness characteristics for this inventoried area have been minimally influenced by past and present development that includes I-70, the D&RGW Railroad, and an existing power line adjacent to the southern boundary of the area. The BLM Moab Field Office has leased this entire area for oil and gas development. If developed, oil and gas activities could dominate the wilderness characteristics of this area. The introduction of the Project (Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E) and the proposed TransWest Express Project in the area south of Hatch Mesa would further influence wilderness values, where wilderness characteristics are not as intact as the area north of Hatch Mesa. Effects on these wilderness values could be reduced if the proposed transmission line projects were colocated with the existing rail line and I-70, which would consolidate disturbances as viewed from Floy Canyon.

Lands with Wilderness Characteristics in BLM Price Field Office

Desolation Canyon

Wilderness characteristics for this inventoried area (refer to Section 3.2.14.5) have been minimally influenced by past and present development that includes U.S. Highway 6, the D&RGW Railroad, and an existing 138kV transmission line adjacent to the western boundary of the area. Additionally, potential oil and gas development on Utah SITLA leases adjacent to the southeast and northwest portions of this area could influence wilderness values in the inventoried area. Due to limited screening opportunities, the introduction of the Project (Alternatives COUT BAX-C, and COUT BAX-E) along the western portion of this inventoried area would further influence and begin to dominate the area which would extend the influence of the Project further into the core of the area. The proposed TransWest Express Project would not traverse this inventoried area. Effects on these wilderness values could be reduced if the Project was sited in closer proximity to U.S. Highway 6, which would increase impacts on views for motorists on this designated scenic road.

Never Sweat Wash

Wilderness characteristics for this inventoried area have been minimally influenced by past and present development that includes the Green River Cutoff Road, which separates Never Sweat Wash from the Lost Spring Wash area, and potential oil and gas development on Utah SITLA leases on lands within the area's boundary. The introduction of the Project (Alternative COUT BAX-C), the proposed TransWest Express Project, and the Twin Bridges Oil and Gas Project would dominate the wilderness characteristics adjacent to Green River Cutoff Road and areas where views of these proposed projects would limit opportunities for solitude and primitive recreation within the core area. Effects on wilderness values could be reduced if the proposed transmission line projects were colocated and sited adjacent to existing modifications, to consolidate disturbances within and adjacent to this area.

Lost Spring Wash

Wilderness characteristics for this inventoried area have been minimally influenced by past and present development that includes the Green River Cutoff Road, which separates Lost Spring Wash from the Never Sweat Wash area, oil and gas development on Utah SITLA leases on lands within the area, and an existing 345kV transmission line adjacent to the southwest edge of the area. The introduction of the Project (Alternatives COUT BAX-B and COUT BAX-C), the proposed TransWest Express Project, and the Twin Bridges Oil and Gas Project would dominate the wilderness characteristics adjacent to the Green River Cutoff Road (Alternative COUT BAX-C), and to a lesser degree along Cottonwood Wash (Alternative COUT BAX-B), as well as in areas where views of these proposed projects would limit opportunities for solitude and primitive recreation. Effects on wilderness values could be reduced if the proposed transmission line projects were colocated and sited adjacent to existing modifications, to consolidate disturbances within and adjacent to this area.

Price River

Wilderness characteristics for this inventoried area have been minimally influenced by past and present development that include potential oil and gas development on Utah SITLA leases. The introduction of the Project (Alternative COUT BAX-E) and the proposed TransWest Express Project would influence wilderness characteristics along the northern edge of this area but there would be limited effects on these characteristics within the core of this inventoried area due to topographical screening offered by the canyon walls adjacent to the Price River. Effects on wilderness values could be reduced if the proposed transmission line projects were colocated and sited further to the north, outside of the inventoried area.

4.3.14.5.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Potential cumulative effects from past, present, and RFFAs located on non-WSA lands with wilderness characteristics, crossed by alternative routes considered in the COUT route grouping, are summarized below by inventoried area.

Lands with Wilderness Characteristics in BLM White River Field Office

Coal Oil Gulch

Wilderness characteristics for this inventoried area (refer to Section 3.2.14.5) have been minimally influenced by past and present development that includes two existing transmission lines located approximately 1,000 feet north of the area and extensive oil and gas development adjacent to the southern boundary. The introduction of the Project (Alternatives WYCO-B, WYCO-C, and WYCO-F) and the proposed TransWest Express Project along the northern portion of the inventoried area would further influence wilderness characteristics. Since these projects are located in proximity to existing development, wilderness values within the core of the inventoried area would be minimally affected. Effects on wilderness values could be further reduced if the proposed transmission line projects were colocated with the existing transmission lines, to the extent practicable.

4.3.15 Inventoried Roadless Areas and Unroaded/Undeveloped Areas

The approach for analysis of cumulative effects on IRAs and unroaded/undeveloped areas units, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the identified direct and indirect impacts from the Project (refer to Section 3.2.15) to IRAs and unroaded/undeveloped areas, and considers these impacts in conjunction with the past, present, and RFFAs listed in Tables 4-1 and 4-2.

4.3.15.1 Issues Identified for Analysis

The following are the issues identified related to IRAs and unroaded/undeveloped areas.

4.3.15.1.1 Potential Impacts on Inventoried Roadless Areas and Unroaded/Undeveloped Areas

Potential impacts of the Project on IRAs and unroaded and undeveloped areas would be the potential inability of the USFS to continue to manage these areas for the wilderness attributes and roadless characteristics for which they were originally designated.

4.3.15.2 Existing Condition

The existing conditions in each of these areas are discussed in Section 3.2.1.5. No IRAs or unroaded/undeveloped areas in Wyoming or Colorado are in the alternative route study corridors.

These wilderness and roadless values have been influenced by past and present actions including recreational infrastructure, oil and/or gas development, roads, pipelines, and transmission lines. These modifications, in general, are compatible with the values identified for each IRA and unroaded/undeveloped area. Many of the areas where land has been leased for oil and/or gas development have not yet been constructed; therefore, the existing condition may appear more natural than would be present after the development of these approved projects.

4.3.15.3 Results

4.3.15.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

There are no IRAs or unroaded/undeveloped areas crossed by the WYCO alternative routes including route variations.

4.3.15.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Past and present actions and RFFAs potentially crossing IRAs and unroaded and undeveloped areas also crossed by alternative routes considered in the COUT BAX route grouping are presented in Table 4-121. IRAs and/or unroaded/undeveloped areas are not analyzed for Colorado because none of these areas are crossed by alternative routes or route variations considered for the Project.

Effects

The following summarizes the effects of past, present, and RFFAs for each IRA and unroaded/undeveloped area crossed by the Project.

TABLE 4-121 INVENTORIED ROADLESS AND UNROADED/UNDEVELOPED AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES								
Unit Name and Type	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development ¹	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
			Past and Present Development	Reasonably Foreseeable Future Actions				
Utah								
Manti-La Sal National Forest								
East Mountain Unroaded/ Undeveloped Area	COUT BAX-B, COUT BAX-C	28,303	18,734	0	0	18,734	9,569	66.0
Oak Creek Unroaded/ Undeveloped Area	COUT BAX-E	5,359	6	0	24	30	5,329	0.6
NOTES: ¹ To avoid overestimating impacts when the Project right-of-way overlaps past and present activities or other reasonably foreseeable future actions (RFFA). A zero incremental project development is assumed. Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total. There is potential for overlap between the Project right-of-way, Past and Present, and RFFA columns								

Manti-La Sal National Forest

IRAs

There are not any IRAs crossed by the COUT BAX alternative routes in the Manti-La Sal National Forest.

Unroaded/Undeveloped Areas

East Mountain Unroaded/Undeveloped Area

Wilderness values for this area have been influenced by past and present development including areas leased for oil and/or gas development in the BLM Richfield and Price Field Offices, the Ferron Natural Gas Project, the Deer Creek Coal Lease, and an existing 345kV transmission line which parallels the southwestern boundary of the area. Since the majority of development is associated with leases that have not yet been explored, there are limited modifications present in the unroaded/undeveloped area but when developed, these activities may dominate opportunities for solitude and primitive recreation opportunities in this area. The Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Project would further influence these wilderness values through the introduction of transmission structures and right-of-way vegetation clearing along the western boundary of this unroaded/undeveloped area.

Oak Creek Unroaded/Undeveloped

Wilderness values in this area have been minimally influenced by development. Since there are no other planned future activities in this area, effects on these values resulting from the Project (Alternative COUT BAX-E) would be the same as those described in Chapter 3 including the short-term impacts on natural processes and views dominated by the Project from the Maple Fork Trail.

4.3.15.3.3 Colorado to Utah – U.S. Highway 40 to Clover (COUT)

Current projects and other RFFAs potentially crossing IRAs and/or unroaded/undeveloped areas also crossed by alternative routes considered in the COUT route grouping are presented in Table 4-122, and are discussed by National Forest (Ashley, Manti-La Sal, and Uinta) for each alternative route. There are no IRAs or unroaded/undeveloped areas analyzed for Colorado because none of these areas are crossed by the Project.

Effects

The following summarizes the past, present, and RFFAs for each IRA and unroaded/undeveloped area crossed by the COUT route grouping.

Ashley National Forest

Inventoried Roadless Area

IRA 0401010

Wilderness and roadless values for this area have been influenced by past and present development including the Berry Petroleum South Unit oil and/or gas project, oil and/or gas leases administered by the BLM Vernal Field Office, and an existing 138kV transmission line paralleling the northwest boundary of the IRA. Since these oil and gas projects are leased areas, which have not been developed to date, there are limited modifications present in the IRA but when developed, these activities may dominate opportunities for solitude and primitive recreation opportunities in this area. The introduction of the Project (Alternative COUT-B) and the TransWest Express Project would further influence these values along the northwestern boundary of the IRA adjacent to Sowers Canyon Road.

TABLE 4-122 INVENTORIED ROADLESS AND UNROADED/UNDEVELOPED AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES								
Unit Name and Type	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development ¹	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
			Past and Present Development	Reasonably Foreseeable Future Actions				
Utah								
Ashley National Forest								
0401010 Inventoried Roadless Area	COUT-B and route variations	21,869	1,367	113	0	1,480	20,155	7.0
0401011 Inventoried Roadless Area	COUT-B and route variations	30,039	5,178	24	0	5,202	24,837	17.0
0401012 Inventoried Roadless Area	COUT-B-1, COUT-B-2, COUT-B-4, COUT-C-1, COUT-C-2, COUT-C-4	46,363	503	5	0	508	45,855	1.0
0401013 Inventoried Roadless Area	COUT-B-1, COUT-B-2, COUT-B-4, COUT-C-1, COUT-C-2, COUT-C-4	11,900	1,618	0	0	1,618	10,281	14.0
Cottonwood Unroaded/ Undeveloped Area	COUT-B and route variations	25,989	4,428	25	0	4,453	21,536	17.0
Right Fork Indian Canyon Unroaded/ Undeveloped Area	COUT-B-1, COUT-C-1	37,473	393	0	0	394	37,080	1.0
Sowers Canyon Unroaded/ Undeveloped Area	COUT-B and route variations	17,028	1,105	98	0	1,203	15,826	7.0
Manti-La Sal National Forest								
Cedar Knoll Inventoried Roadless Area	COUT-A, COUT-B, and COUT-C and route variations	22,484	3,192	25	0	3,218	19,267	14.0
Cedar Knoll Unroaded/ Undeveloped Area	COUT-A and COUT-B and route variations	28,351	3,879	46	18	3,943	24,409	14.0
	COUT-C and route variations		3,879	46	19	3,944	24,408	14.0

TABLE 4-122 INVENTORIED ROADLESS AND UNROADED/UNDEVELOPED AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES								
Unit Name and Type	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development ¹	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
			Past and Present Development	Reasonably Foreseeable Future Actions				
East Mountain Unroaded/ Undeveloped Area	COUT-I	28,303	18,734	0	0	18,734	9,569	66.0
Oak Creek Unroaded/ Undeveloped Area	COUT BAX-E	5,359	6	0	27	33	5,326	0.6
Uinta-Wasatch-Cache National Forest								
Chipman Creek (418008) Inventoried Roadless Area	COUT-A	9,360	94	212	0	306	9,054	3.0
	COUT-A-1		94	212	51	357	9,002	4.0
Willow Creek (418009) Inventoried Roadless Area	COUT-A	18,049	161	1	0	162	17,887	0.9
Solider Summit (418019) Inventoried Roadless Area	COUT-B-1, COUT-B-2, COUT-B-4, COUT-C-1, COUT-C-2, COUT-C-4	6,848	72	32	0	104	6,744	2.0
NOTES: ¹ To avoid overestimating impacts when the Project right-of-way overlaps past and present activities or other reasonably foreseeable future actions (RFFA). A zero incremental project development is assumed. Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total. There is potential for overlap between the Project right-of-way, Past and Present, and RFFA columns								

IRA 0401011

Wilderness and roadless values for this area have been influenced by past and present development including the Berry Petroleum South Unit oil and/or gas project, oil and/or gas leases administered by the BLM Vernal Field Office, and an existing 138kV transmission line paralleling the southeast boundary of the IRA. Similar to the discussion for IRA 0401010, since the majority of these actions are leases that have not been developed, there are limited existing modifications present in the IRA. Through the introduction of the Project (Alternative COUT-B) and the TransWest Express Project, these values would be further influenced by development adjacent to Sowers Canyon Road along the southeast boundary of the IRA.

IRA 0401012

Wilderness and roadless values for this area have been influenced by past and present development in the northeast corner of the IRA associated with oil and/or gas leases administered by the BLM Vernal Field Office. Since these leases have not yet been developed, there are limited existing modifications in this area. The introduction of the Project (Route Variations COUT-B-1, COUT-B-2, COUT-B-4, COUT-C-1, COUT-C-2, and COUT-C-4) and the TransWest Express Project would dominate solitude and primitive recreation values adjacent to the Reservation Ridge Scenic Backway but these values within the steeply sloped canyons would be minimally affected by these projects. Since these projects would traverse the edge of the IRA, other wilderness and roadless values within the IRA would be minimally modified.

IRA 0401013

Due to the limited extent of past and present development in the IRA, the wilderness and roadless values for this area have been minimally influenced. The introduction of the Project (Route Variations COUT-B-1, COUT-B-2, COUT-B-4, COUT-C-1, COUT-C-2, and COUT-C-4) and the TransWest Express Project would minimally affect these values since only the right-of-way, and associated vegetation clearing activities, would occur within the IRA. Opportunities for solitude would be modified along the southern boundary of the IRA where these primitive recreation opportunities are limited.

Unroaded/Undeveloped Areas**Cottonwood Unroaded/Undeveloped Area**

Wilderness values for this area have been influenced by past and present development including the Berry Petroleum South Unit oil and/or gas project, oil and/or gas leases administered by the BLM Vernal Field Office, and an existing 138kV transmission line paralleling the northwest boundary of the area. Since these oil and gas projects are leased areas, which have not been developed to date, there are limited modifications present in the area but when developed, these activities may dominate opportunities for solitude and primitive recreation opportunities in this area. The introduction of the Project (Alternative COUT-B) and the TransWest Express Project would further influence these values along the northwestern boundary of the area adjacent to Sowers Canyon Road.

Right Fork Indian Canyon Unroaded/Undeveloped Area

Wilderness values for this area have been influenced by past and present development including the Berry Petroleum South Unit oil and/or gas project, oil and/or gas leases administered by the BLM Vernal Field Office, and an existing 138kV transmission line paralleling the southeast boundary of the area. Similar to the discussion for the Sowers Canyon Unroaded/Undeveloped Area, since the majority of these actions are leases that have not been developed, there are limited existing modifications present in the area. Through the introduction of the Project (Alternative COUT-B) and the TransWest Express Project, these

values would be further influenced by development adjacent to Sowers Canyon Road along the southeast boundary of the area.

Sowers Canyon Unroaded/Undeveloped Area

Wilderness values for this area have been influenced by past and present development in the northeast corner of the area by oil and/or gas leases administered by the BLM Vernal Field Office. Since these leases have not yet been developed, there are limited existing modifications in this area. The introduction of the Project (Route Variations COUT-B-1, COUT-B-2, COUT-B-4, COUT-C-1, COUT-C-2, and COUT-C-4) and the TransWest Express Project would dominate solitude and primitive recreation values adjacent to the Reservation Ridge Scenic Backway but these values within the steeply sloped canyons would be minimally affected by these projects. Since these projects would traverse the edge of the unroaded/undeveloped area, other wilderness and roadless values within the area would be minimally modified.

Manti-La Sal National Forest

Inventoried Roadless Areas

Cedar Knoll IRA

Wilderness and roadless values for this area have been influenced by active SITLA-administered oil and/or gas leases and an existing 345kV transmission line adjacent to the western boundary of the IRA, which also crosses the area for a short distance. Through the introduction of the Project (Alternatives COUT-A, COUT-B, and COUT-C) and the TransWest Express Project, these values would be further influenced by development but since only the right-of-way for these projects would traverse the IRA, there would be limited effects on these values.

Unroaded/Undeveloped Areas

Cedar Knoll Unroaded/Undeveloped Area

Wilderness values for this area have been influenced by active SITLA-administered oil and/or gas leases and an existing 345kV transmission line adjacent to the western boundary of the area. The introduction of the Project (Alternatives COUT-A, COUT-B, and COUT-C) and the TransWest Express Project, which both cross the boundary of this area, would affect wilderness values along the southwest corner of the unroaded/undeveloped area in proximity to the existing 345kV transmission line. Opportunities for solitude and primitive recreation would be influenced by these projects in an area with limited existing recreation opportunities.

East Mountain Unroaded/Undeveloped Area

Wilderness values for this area have been influenced by past and present development including areas leased for oil and gas development in the BLM Richfield and BLM Price Field Offices, the Ferron Natural Gas Project, the Deer Creek Coal Lease, and an existing 345kV transmission line which parallels the southwestern boundary of the area. Since the majority of this development is associated with leases that have not yet been developed, there are limited modifications present in the unroaded/undeveloped area but when developed, these activities may dominate opportunities for solitude and primitive recreation opportunities in this area. The introduction of the Project (Alternatives COUT-I) and the TransWest Express Project would further influence these wilderness values through the introduction of transmission structures and right-of-way vegetation clearing along the western boundary of this unroaded/undeveloped area.

Oak Creek Unroaded/Undeveloped Area

Wilderness values in this area have been minimally influenced by development. Since there are no other planned future activities in this area, effects on these values resulting from the Project (Alternative COUT-H) would be the same as those described in Chapter 3 including the short-term impacts on natural processes and views dominated by the Project from the Maple Fork Trail.

Uinta-Wasatch-Cache National Forest

Inventoried Roadless Areas

Chipman Creek IRA (418008)

Wilderness and roadless values in the IRA have been minimally influenced by past and present development except for an existing 345kV transmission line which forms the southern boundary of the area and influences opportunities for solitude and primitive recreation along the southern edge of the IRA. Through the introduction of the Project (Alternative COUT-A) and the TransWest Express Project, there would be increased modifications adjacent to the IRA but through micro-siting of towers, the IRA could be spanned therefore minimizing effects on these values. Route Variation COUT-A-1 would introduce additional effects in the IRA, as described in Chapter 3, since the Project would traverse the IRA for 3.1 miles.

Willow Creek IRA (418009)

Wilderness and roadless values in the IRA have been influenced by past and present development along the northern boundary of the area where an existing 345kV transmission line traverses the IRA including more than 20 transmission structures and associated right-of-way vegetation clearing. The introduction of the Project (Alternative COUT-A) and the TransWest Express Project, would be further influenced these values by the presence of additional transmission lines but since only the right-of-way for these projects would traverse the IRA, there would be minimal effects on these values.

Solider Summit IRA (418019)

Wilderness and roadless values in the IRA have been minimally influenced by past and present development. The addition of the Project (Route Variations COUT-B-1, COUT-B-2, COUT-B-4, COUT-C-1, COUT-C-2, and COUT-C-4) and the TransWest Express Project would influence these values adjacent to Tabbyune Road where only the right-of-way would traverse the IRA. Due to the minimal project activities in the IRA, limited effects on these values are anticipated unless the TransWest Express Project alternative which traverses the IRA for approximately 1 mile is selected. This route would introduce additional cumulative effects on the values identified for this IRA which would be reduced by paralleling the Project's alignment, which also avoids steeper terrain north of Tabbyune Creek.

Unroaded/Undeveloped Areas

There are no unroaded/undeveloped areas crossed by the COUT alternative routes in the Uinta-Wasatch-Cache National Forest.

4.3.16 Visual Resources

Cumulative effects in context with visual resources would result from the incremental impacts on scenery and the viewsheds associated with public viewing areas based on the construction and operation of the Project in context with past, present, and RFFAs. The incremental impacts on these landscapes and viewsheds would result from changes to the existing landform through earthwork including road construction, alteration of existing vegetation patterns due to vegetation management, and the

introduction of man-made structures that typically would be incongruent or similar with existing features that define landscape character. The approach for analysis of cumulative effects on visual resources, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the assessment of impacts from the Project (refer to Section 3.2.16) in relation to the past, present, and RFFAs listed in Tables 4-1 and 4-2.

Cumulative effects for visual resources were evaluated and characterized in context with one, or a combination of, the three types of effects: (1) additive – the effects of the actions add together to make up the cumulative effect, (2) countervailing – the effects of some actions balance or mitigate the effects of other actions, and (3) synergistic – the effects of the actions together is greater than the sum of their individual effects (BLM 2008b). In general for visual resources in context with transmission line projects, if the Project is colocated with other existing or future linear projects, cumulative effects are synergistic because the form, line, color and texture of the features of the facilities (i.e., access roads, earthwork, and facilities) are similar and form a cohesive, united feature in the landscape. If new projects are located outside the context of existing corridors, landscapes (i.e., scenic quality rating units) would be further divided and the cumulative effect becomes strongly additive. In terms of effects on views, the larger corridor could be more dominant based on site-specific viewing conditions, separation of facilities, and other elements. However, if the projects are sited in context with existing transmission lines and they are similar in scale, form, line, color and texture, the cumulative effect would be reduced due to the synergistic relationship of the Project's features.

4.3.16.1 Issues Identified for Analysis

4.3.16.1.1 Scenery

As described in Section 3.2.16, scenery is defined as a continuous unit of land comprised of harmonizing features that result in and exhibit a distinct landscape character. A cumulative effect on scenery would result from the industrialization of natural appearing landscapes through the construction of multiple projects and the alteration of existing landscape's characteristics including landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modification. In general, those areas where transmission line projects would be colocated such that they are visually related, effects would be reduced. Matching spans to the extent practicable and sharing construction and maintenance access roads would further reduce cumulative effects of such projects. In forested areas where projects would have a limited visual relationship with one another, or the projects deviate from using the same corridor, cumulative effects generally increase as the landscape become more fragmented and thus the industrial nature of transmission line projects would have a stronger effect on landscape character.

4.3.16.1.2 Views

Viewing locations represent places where the public would have the potential to view the Project and typically include residences, travel routes, recreation areas, and special designations. Cumulative effects would occur where viewers would perceive the alteration of the landscape components of landform, vegetation, and structure through the introduction of the Project in addition to existing disturbances and RFFAs. Multiple transmission lines and/or other energy facilities (e.g., wind farms, natural gas wells, etc.) seen in context with the Project would dominate views from viewing locations with moderate to high concern for changes in the landscape. Generally, the dominance of the aggregation of a project is reduced when the project features are visually similar (i.e., transmission lines seen in context with other transmission lines). Inversely, if the aggregate of the projects are incongruent (i.e., a mixture of natural gas wells, with transmission lines, and other modifications), cumulative effects are greater.

4.3.16.2 Existing Condition

Residential and industrial development in general has altered the existing landscape character associated with scenic quality rating units (refer to Maps 3-8a and 3-8b for SQRUs crossed by the Project) and views from identified viewing locations throughout the Project study area. Below is a summary of the major areas of development in each state traversed by the Project.

Throughout the Wyoming portion of the Project area, industrial development, primarily associated with oil and gas production, dominates the existing landscape character. In particular, the area between the I-80 corridor and the Wyoming-Colorado border has extensive oil and gas development that has resulted in visual alterations that are co-dominant with the natural landscape features. Few existing transmission lines occur in this area except for an existing 230kV transmission line connecting Hanna and Rock Springs, which has similar design characteristics as the Project, but due to the scale of the existing transmission line, it does not dominate the existing natural landscape features.

In Colorado, existing development primarily is located along Colorado State Highway 13 and U.S. Highway 40, and is associated with rural, dispersed residences and agricultural development, which are generally subordinate to the natural landscape features. South of Rangely toward Baxter Pass, numerous areas of oil and gas development are located along Rio Blanco County Road 23 and along the floor of West Salt Creek Canyon south of Baxter Pass, which begin to dominate the natural landscape features. Several existing transmission lines, with similar design characteristics as the Project, run from the Craig Power Station, adjacent to U.S. Highway 40, to the Colorado-Utah border south of the community of Dinosaur and begin to dominate the natural landscape features.

Oil and gas development has modified and is co-dominate with the landscape character in several areas in Utah including the Uinta Basin, Castle Valley, and northwest of Cisco. There are three existing 345kV transmission lines corridors, with similar design characteristics as the Project, located adjacent to Project alternative routes including: (1) from Green River through the San Rafael Swell and over the Wasatch Plateau to Mona; (2) from the Utah-Colorado border through the Uinta Basin and Uinta-Wasatch-Cache National Forest to Mona; and (3) two lines from the Huntington Power Station to Spanish Fork Canyon, which each locally dominate the natural landscape features. In addition to the existing 345kV transmission lines, several smaller 138kV transmission lines occur adjacent to Project alternative routes including: parallel to U.S. Highway 6 between Green River and Price, from Sowers Canyon through Argyle and Willow Creek canyons to the Carbon Power Station, Spanish Fork Canyon, and from the Bonanza Power Station to the community of Vernal. These lower-voltage transmission lines have similar design characteristics as the Project except they are smaller in scale and as such, they influence but do not dominate the existing natural landscape features. Several power plants are located adjacent to Project alternative routes including the Bonanza, Huntington, and Carbon power plants, which dominate the local landscape character and influence adjacent views. In addition to these industrial modifications, dispersed residences and agricultural development have modified the existing landscape character in the Uinta Basin, Castle Valley, Sanpete Valley, and Juab Valley but generally are subordinate to the natural landscape features.

4.3.16.3 Results

4.3.16.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Scenery

Table 4-123 lists the cumulative effects for the WYCO alternative routes.

TABLE 4-123 SCENERY CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Scenery Units not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
Alternative WYCO-B and Route Variations							
WYCO-B (Applicant Preferred Alternative)	4,550,600	3,063,600	396,200	4,300	3,464,200	1,086,500	23.9
WYCO-B-1	4,550,600	3,063,600	396,200	6,300	3,466,100	1,084,500	23.8
WYCO-B-2 (Agency Preferred Alternative)	4,569,800	3,070,500	396,400	4,300	3,471,200	1,098,600	24.0
WYCO-B-3	4,550,600	3,063,600	396,200	4,300	3,464,200	1,086,400	23.9
Alternative WYCO-C and Route Variations							
WYCO-C	4,929,800	3,250,100	565,500	3,200	3,818,800	1,111,000	22.5
WYCO-C-1	4,929,800	3,250,100	565,500	5,200	3,820,800	1,109,100	22.5
WYCO-C-2	4,949,000	3,257,000	565,600	3,200	3,825,800	1,123,200	22.7
WYCO-C-3	4,929,800	3,250,100	565,500	3,200	3,818,800	1,111,000	22.5
Alternative WYCO-D and Route Variation							
WYCO-D	4,683,600	3,389,400	208,800	14,900	3,613,200	1,070,400	22.9
WYCO-D-1	4,683,600	3,389,400	208,800	14,900	3,613,200	1,070,400	22.9
Alternative WYCO-F and Route Variations							
WYCO-F	4,495,900	3,147,200	370,100	2,900	3,520,100	975,800	21.7
WYCO-F-1	4,495,900	3,147,200	370,100	4,800	3,522,100	973,800	21.7
WYCO-F-2	4,515,100	3,154,100	370,200	2,900	3,527,200	987,900	21.9
WYCO-F-3	4,495,900	3,147,200	370,100	2,900	3,520,100	975,800	21.7
NOTES: ¹ Area of scenery units not influenced by development Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.							

Issue Areas

Scenery issues, as described in the direct Project effects discussion in Chapter 3, include the following landscapes (SQRUs):

- Adobe Town Region
- Little Snake River Valley
- Yampa River

In addition through the analysis of cumulative effects on scenery, the Flat Tops SQRU (i.e., Flat Top Mountain) as well as Elk Springs SQRU were identified as landscapes where the Project's influence area includes many areas not influenced by past, present, or other future actions.

Effects

Due to the large amount of existing industrial development, including expansive oil and gas fields, many of the landscapes north and east of Flat Top Mountain in the Rawlins Field Office have been influenced visually by these landscape modifications. South of Flat Top Mountain to U.S. Highway 40, the TransWest Express Transmission Project would modify primarily the same landscapes that would be influenced by the Project. Therefore, if the TransWest Express Transmission Project and the Project were

not colocated, these two projects would influence additional areas whereas being colocated would consolidate the areas of modification. As such, many landscapes (SQRUs) would be completely influenced by past, present, and future projects, as analyzed, including: Atlantic Rim, Bolton Ranch, Cedar Breaks, Chalk Bluff, Continental Divide, Creston, Delaney Rim, Doty Mountain, Fortification Rocks, Muddy Creek, Platte North, Rawlins/Sinclair, Red Rim, Sage Creek, and The Sand Hills. It is important to note that Alternative WYCO-D and its route variation would influence an additional 10,000 acres when compared to other alternative routes in this route grouping. This distinction is primarily a result of the TransWest Express Transmission Project alternative in this area not being colocated with the Project south of Baggs, Wyoming. To reduce cumulative effects in this area, the two transmission projects should be colocated to the extent practicable.

Adobe Town Region

The Adobe Town SQRU has approximately 30 percent of its area influenced by existing development including oil and gas development as well as several existing pipelines located adjacent to the alignment of Alternative WYCO-C. These elements have introduced landscape character deviations through modification of the landscape's landforms and vegetation patterns, in particular, the geometric features associated with the existing pipeline rights-of-way. In addition to the structures associated with existing oil and gas development, the TransWest Express Transmission Project would introduce transmission line structures adjacent to the proposed alignment for Alternative WYCO-C through this landscape. As such, only Alternative WYCO-C and its route variations would extend the influence of development further into the western portion of the Adobe Town Region by approximately 300 acres.

Little Snake River Valley

The area around Baggs, Wyoming, known as the Little Snake (River) Valley, has been influenced by existing development including several pipelines, adjacent oil and gas development, and widespread dispersed residences which have modified the existing character of the landscape. It is important to note the presence of dispersed residences in this valley produces a strong rural character which has been minimally influenced by industrial development. The introduction of the TransWest Express Transmission Project into this landscape would produce a more industrialized landscape character, which if Alternative WYCO-D, and to a lesser degree Alternative WYCO-F, were chosen would extend this area of development. This industrialization would be produced by the introduction of transmission line structures, clearing of vegetation in the rights-of-way, and the development of construction access roads which would modify the existing landscape's form, line, color, and texture. To reduce cumulative effects on the character of this landscape, potential mitigation would include colocation of the two transmission projects to the extent practicable.

Yampa River

The Yampa River is represented by several landscape units as delineated by the BLM Little Snake Field Office through their SQRU inventory. These include, from east to west, the Yampa River Valley/Hayden, Duffy Valley, Juniper Hot Springs, Juniper Mountain (northern edge), Maybell, and Cross Mountain Canyon. The eastern portion of the Yampa River traversed by Alternative WYCO-D, Yampa River Valley/Hayden, has been influenced by the development around Craig, Colorado including the Trapper Mine, Craig Power Plant, and multiple existing transmission lines and pipelines. Due to the extent of the existing development which has industrialized this area, as well as future development including the expansion of the Trapper Mine and the TransWest Express Transmission line, the Project would have minimal additional influence on this landscape's character. The next three portions of the Yampa River (Duffy Valley, Juniper Hot Springs, and Juniper Mountain) also are associated with Alternative WYCO-D where the Project would parallel multiple existing transmission lines as well as an alternative for the TransWest Express Transmission Project. In addition, an area of permitted oil and gas wells along the

western portion of the Duffy Valley landscape would further modify the character of this landscape. The next portion of the Yampa River, the Maybell landscape, would be crossed by Alternatives WYCO-B, WYCO-C, and WYCO-F with Alternative WYCO-D located approximately 0.5 mile away. The portion of the Maybell landscape crossed by Alternatives WYCO-B, WYCO-C, and WYCO-F has been minimally influenced by an existing pipeline and residences, but through the addition of the TransWest Express Transmission Project, would become more industrialized. Due to the Project and the TransWest Express Transmission Project being colocated in this area, the Project would not increase the influence of the development in this landscape but would produce more intense cumulative effects. Alternative WYCO-D crosses the Maybell landscape adjacent to multiple transmission lines in an area influenced by U.S. Highway 40 and dispersed residences. The final portion of the Yampa River in the study area, Cross Mountain Canyon, has been influenced minimally by existing development. Since the TransWest Express Transmission Project has an alternative route approximately 1.25 miles away from this landscape, whereas the Project on Alternatives WYCO-B, WYCO-C, and WYCO-F would be located approximately 2.5 miles away, the Project would have minimal additional influence on this landscape.

Flat Tops

The landscape known as Flat Top Mountain (or Flat Tops SQRU) has been influenced visually by existing oil and gas development along the northern portion of the landscape and pipelines corridors along the western edge. The remaining portions of this landscape have minimal influence from development and have a more intact landscape character. Through the development of RFFAs, including the TransWest Express Transmission Project and proposed future oil and gas development, this landscape would begin to become industrialized in character. The Project would have varying levels of influence on the industrialization of this landscape based on the alternative route selected. Alternatives WYCO-C, WYCO-D, and WYCO-F would have limited additional visual influence on Flat Top Mountain whereas Alternative WYCO-B would traverse this landscape across steep slopes. If both proposed transmission projects were to be located along the western portion of Flat Top Mountain (Alternative WYCO-B), this area would become further industrialized as a result of the presence of transmission line structures, right-of-way vegetation clearing, and the construction of access roads.

Elk Springs

A small SQRU located along the escarpment heading west from Elk Springs, as digitized by the BLM White River Field Office, would be the landscape most influenced by the Project, in this route grouping, where existing development has not yet influenced the landscape character. It is important to note that this additional influence is the expansion of development further to the northwest from the existing transmission lines adjacent to U.S. Highway 40. Since the alternative routes for the TransWest Express Transmission Project are located south of the existing transmission lines and the Project (all WYCO alternative routes) would be located north of the existing lines, an additional 8.3 percent of the Elk Springs SQRU would be influenced by the Project.

Cumulative effects associated with the route variations are similar to the main alternative routes except the first variation for Alternatives WYCO-B, WYCO-C, and WYCO-F where the route variation would be located further to the east at the Little Snake River crossing. This would locate the Project away from alternative routes for the TransWest Express Transmission Project, which would increase the Project's visual influence on the Seven Mile SQRU by approximately 2,000 acres in an area where there are limited past, present or future landscape character modifications.

Viewing Locations

Views from identified viewing locations would have a range of cumulative effects resulting from the addition of the Project in context with past, present, and future actions and to focus on the key issues, this analysis will focus on the 6 simulation locations identified in Table 4-124 along this route grouping.

TABLE 4-124 CUMULATIVE EFFECTS SIMULATION LOCATIONS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES		
Simulation Location (Key Observation Point) Number	Simulation Location (Key Observation Point) Name	Alternative Routes
52 ¹	Dispersed residences southwest of Craig	WYCO-D and route variation
66 ¹	Dispersed residence along Colorado State Highway 13	WYCO-D and route variation
197 ¹	Hanna residential	WYCO-D and route variation
220	North Platte River Special Recreation Management Area	WYCO-B, WYCO-C, WYCO-D, and WYCO-F and their route variations
225	Outlaw Trail Loop Scenic Drive(Wyoming Highway 789 north of Baggs)	WYCO-D and route variation
299	East Cross Mountain River Access	WYCO-B, WYCO-C, WYCO-D, and WYCO-F and their route variations
NOTES: ¹ Cumulative effect simulation not prepared since neither the TransWest Express Transmission Project or Gateway West 500kV Transmission Project would be visible in the area of the direct effect simulation Cumulative simulations are located in Appendix H.		

Key Observation Point Number 52 – Dispersed residences southwest of Craig

Views from these dispersed residences have already been modified as a result of existing transmission lines, development around Craig, and potentially through development of oil and gas lease areas. While not shown in the simulation, the Craig power plant is visible from this location when looking toward the southeast, which has an even greater influence on views for residences located further to the east. These existing modifications have introduced several industrial structures that begin to dominate views from these residences. Through the addition of the Project (Alternative WYCO-D and route variation), which has similar design characteristics to the existing transmission lines, as well as the TransWest Express Transmission Project (located south of this viewpoint out of view of the simulation), these views would be completely dominated by industrial development which due to the separation between these two transmission line projects, would extend the area viewed as modified to reduce this visible expansion of industrial development, potential mitigation would be to site the two transmission projects as close to the existing transmission line as practicable.

Key Observation Point Number 66 – Dispersed Residence along Colorado State Highway 13

Due to the limited extent of existing development in this area, including dispersed residential development and minor pipelines, views have been modified minimally by development. Through the introduction of the Project (Alternative WYCO-D and route variation) and the TransWest Express Transmission Project, views from dispersed residences along Colorado State Highway 13 would begin to be dominated by transmission lines. It is important to note as currently designed, the TransWest Express Transmission Project would not be visible in the simulation as it is located on the west side of Colorado State Highway 13. This separation between the two proposed transmission lines would place residences between both projects, as well as Colorado State Highway 13, which would create a tunnel-effect and

dominate views from these locations. To reduce the cumulative effect on these views, potential mitigation would include colocation of the two projects to the extent practicable.

Key Observation Point Number 197 – Hanna Residential

Views from residences in this portion of Hanna have views influenced by existing transmission lines and development south of Hanna. Due to the scale of the existing transmission lines and construction materials (wood), these features do not dominate views from Hanna. With the addition of the Project (Alternative WYCO-D and route variation), views would begin to be dominated by transmission line structures toward the west, in particular the Project's skylined transmission structures. Note that the Gateway West 500kV Transmission Project does not have a colocated route in this area.

Key Observation Point Number 220 – North Platte River Special Recreation Management Area (simulation)

Views from the North Platte River SRMA have been minimally modified by development except for I-80, located 1.25 miles north of this viewpoint, and the series of pipelines, which are screened from view at this location. These existing modifications have increased dominance where viewers are located directly adjacent to these areas, but in general, views from in this recreation area are intact. Through the introduction of the Project (all alternative routes in this route grouping) as well as the Gateway West 500kV Transmission Project, views would become dominated by transmission lines, which may include transmission structures skylined on ridges which would further dominate views as shown in the cumulative effect simulation. To reduce the cumulative effect of these projects on views from the North Platte River SRMA, these two projects should be colocated in an area where they could be screened partially by topography, which would minimize their perceived dominance on views.

Key Observation Point Number 225 – Outlaw Trail Loop Scenic Drive (WY 789 north of Baggs) (simulation)

Motorists on this county-designated scenic drive have long duration views of existing oil and gas development as well as areas leased for oil and gas development. From the simulation location, these modifications are not readily apparent but through the expansion of future oil and gas leases areas as well as the introduction of the Project (Alternative WYCO-D and route variation) and the TransWest Express Transmission Project, views along this scenic drive would become dominated by industrial development. In particular, the introduction of transmission and oil and gas-related structures, that due to proximity to the road, may be skylined, which would further increase their dominance on these views as shown in the cumulative effect simulation. To reduce cumulative effects, potential mitigation would include colocation of the two transmission projects as far from this scenic road as practicable. Views from the scenic drive of Alternative WYCO-F and route variations would be similar to the description for Alternative WYCO-D except the Project would be located approximately 2.5 miles away in a location where views of the Project would be screened partially to fully by topography. It is important to note the other alternative routes in this route grouping cross the scenic drive further to the north, adjacent to I-80, in an area that is dominated by existing and planned future oil and gas development. Since the scenic drive would not be paralleled by the Project on those alternative routes, the additional cumulative effect introduced by the Project on those alternative routes would be minimal.

Key Observation Point Number 299 – East Cross Mountain River Access (simulation)

Views from this recreation area, specifically access to the site, generally are intact with few existing cultural modifications. Both the Project (Alternatives WYCO-B, WYCO-C, and WYCO-F including all route variations) as well as one alternative for the TransWest Express Transmission Project would be located nearly 3 miles away from this viewpoint with a portion of each of these two projects screened by

topography. A series of transmission structures, associated with the Project and the TransWest Express Transmission Project, would be skylined on the distant ridgeline and, therefore, influence but not dominate views from this area as shown in the cumulative effect simulation. If the alternative route for the TransWest Express Transmission Project located less than 0.5 mile from this viewpoint was developed, views would begin to be dominated by the TransWest Express Project, which may include additional skylined transmission structures.

4.3.16.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Scenery

Table 4-125 lists the cumulative effects for the COUT BAX alternative routes.

Issue Areas

Scenery issues, as described in the direct Project effects discussion in Chapter 3, include the following landscapes (SQRUs):

- Book Cliffs
- Grand Valley
- Tavaputs Plateau
- Wasatch Plateau Alpine
- Wasatch Plateau
- Wasatch Plateau Parks landscape

In addition through the analysis of cumulative effects on scenery, the Big Horse Draw and Douglas Pass SQRUs were identified as landscapes where the Project's area influence includes many areas not influenced by past, present, or other future actions.

TABLE 4-125 SCENERY CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Scenery Units not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
COUT BAX-B	4,909,000	3,204,600	431,600	8,600	3,644,800	1,264,200	25.8
COUT BAX-C	4,924,000	3,192,400	463,900	8,600	3,665,000	1,259,000	25.6
COUT BAX-E	5,103,500	3,314,600	475,200	10,300	3,800,100	1,303,400	25.5
NOTES: ¹ Area of scenery units not influenced by development Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.							

Effects

Due to the presence of existing development and proposed future development, including but not limited to the TransWest Express Transmission Project, there are locations where entire scenery units would be influenced by past, present, and future projects. As analyzed these landscapes (SQRUs) include: Cedar Mountain, Education Creek, Hadden Hills/Oil Well Dome, Last Spring, and Prickly Pear Flat. In particular, Education Creek has been influenced by multiple pipelines which traverse this narrow landscape. The other four landscapes are located in the northern portion of the San Rafael Swell and have

been influenced by permitted oil and gas development on SITLA-administered land, existing transmission lines, and future energy production areas (Woodside site, Blue Castle Nuclear Power Plant, and a proposed wind facility on Cedar Mountain).

Big Horse Draw

The arid juniper hills southwest of Rangely were identified as the Big Horse Draw SQRU by the BLM White River Field Office. The majority of this landscape has been influenced by past, present, and future projects including areas of existing and permitted oil and gas development, several existing pipelines, and a proposed alternative route for the TransWest Express Transmission Project. Due to the separation between the Project (Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E) and the TransWest Express Transmission Project, additional areas (approximately 2.6 percent of the SQRU area) would be influenced visually by the Project where past, present, or future projects would not have a visual influence.

Book Cliffs

The area known as the Book Cliffs is made up of several smaller SQRUs including the Book Cliffs (BLM Grand Junction Field Office), Demaree WSA (BLM Grand Junction Field Office), Book Cliffs Bench (BLM Moab Field Office), and Green River/Book Cliffs (BLM Price Field Office). In the location where the Project would cross through the Book Cliffs in Colorado (along the edge of the Book Cliff and Demaree WSA landscapes), the scenery has been influenced by existing oil and gas development and a series of existing pipelines. This area would be influenced further by industrial development as a result of the TransWest Express Transmission Project, which would be located adjacent to Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E. Additional areas influenced by the presence of the Project would be minimal but due to the narrow canyon traversing through the Book Cliffs, where both of these transmission line projects would be located, these projects should be colocated to the extent practicable to avoid crossing steep slopes on the canyon walls. In Utah, the landscapes associated with the Book Cliffs (Book Cliff Bench and Green River/Book Cliff SQRUs) would not be crossed by the Project but are located in the area that would be influenced by the Project. Due to the location of existing modifications including Utah SITLA-administered oil and gas leases and underground coal mining, as well as future actions including the Woodside site, Blue Castle Nuclear Power Plant, and the TransWest Express Transmission Project, the Project would influence few areas not already influenced by these past and future projects. Through the cumulative development of all of these projects, the Book Cliffs would be located adjacent to increasingly industrialized landscapes.

Douglas Pass

Located between Douglas Pass and Baxter Pass (including the upper portion of Baxter Pass) this SQRU, as delineated by the BLM White River Field Office, includes areas of existing and permitted oil and gas development, communication facilities, and multiple pipelines located along both the east and west edge of this landscape which have visually influenced approximately half of the scenery unit. Similar to the Big Horse Draw SQRU, the separation between the Project and the TransWest Express Transmission Project would produce areas that would only be influenced by the presence of the Project.

Grand Valley

This valley includes the communities of Fruita and Grand Junction as well as the surrounding agricultural fields. Due to the extensive existing development located in the valley, which also includes several existing transmission lines, pipelines, and I-70; the Project (Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E) would minimally influence this landscape.

Tavaputs Plateau

The area known as the Tavaputs Plateau, or more specifically the East Tavaputs Plateau, is made up of several smaller SQRUs as delineated by the BLM White River and Grand Junction Field Offices including Baxter Pass, Big Horse Draw (previously discussed), Bitter Creek Canyon, Canyon Pintado, Douglas Pass (previously discussed), Education Creek, Oil Springs WSA, Park Mountain/Park Canyon, Rabbit Mountain, Rat Hole Ridge/Achee Uplands, Spring Creek, and Upper Bitter Creek/Bitter Creek. These landscapes have been modified by development including several pipelines as well as existing and permitted oil and gas wells. In addition to the existing modifications in these landscapes, the Project would parallel the proposed TransWest Express Transmission Project along Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E. The addition of the Project along with these past, present, and future projects would modify the existing landforms and vegetation patterns present in these landscapes as well as introduce a series of industrial structures associated with the two proposed transmission line projects and expanding oil and gas fields.

Wasatch Plateau Alpine

This scenery unit was digitized to represent the western ridgeline of the Wasatch Plateau above the community of Mount Pleasant. Other than an existing transmission line which crosses the ridge, there are few existing landscape character modifications. The majority of this area has been leased by the BLM Richfield Field Office for oil and gas development which would further modify the landscape character. The addition of the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project would begin to industrialize the area above Potters Pond through the presence of transmission line structures, access roads, and geometric right-of-way vegetation clearing. To reduce cumulative effects on this narrow scenery unit, the two proposed transmission lines should be located as close as practicable to the existing transmission line.

Wasatch Plateau

The scenery unit that comprises the northern portion of the Wasatch Plateau covers a large portion of the Manti-La Sal National Forest from U.S. Highway 6 to Joes Valley Reservoir. As such, there are areas of more intense existing development and areas with limited landscape character modifications. Existing modifications include surface facilities associated with underground coal mining, existing transmission lines and pipelines, and areas leased for oil and gas development. With the addition of the TransWest Express Transmission Project into this scenery unit, the Project, along Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E, would not visually influence additional areas that have not already influenced by past, present, or future actions including the TransWest Express Transmission Project. The presence of the Project, including the transmission line structures, access roads, and right-of-way vegetation clearing, would produce a more intense localized cumulative effect on scenery if the Project were colocated with TransWest Express and the existing transmission line along Alternatives COUT BAX-B and COUT BAX-C. Whereas if the Project and the TransWest Express Transmission Project were not colocated, there would be a more diffuse but widespread cumulative effect on the Wasatch Plateau landscape in context with other past, present, and future actions.

Wasatch Plateau Parks Landscape

There are two park landscapes located on the Wasatch Plateau with the area known as Scad Valley, which would be crossed by Alternatives COUT BAX-B and COUT BAX-C, and the park adjacent to Gooseberry Creek (Gooseberry Creek valley) which would be crossed by Alternative COUT BAX-E. Scad Valley has few existing cultural modifications except for the presence of an existing transmission line, but through development of oil and gas leased areas as well as coal lease areas, this landscape has the potential to become industrialized. In addition to the past and present development in Scad Valley, the

introduction of the Project and the TransWest Express Transmission Project would further industrialize the southern portion of this landscape unit through the presence of transmission line structures, access roads, and right-of-way vegetation clearing. The other park landscape, Gooseberry Creek valley, has fewer existing landscape character deviations than Scad Valley, except for areas leased for oil and gas areas development along the eastern edge of this scenery unit. An existing pipeline is located along the northern edge of the landscape which has modified the local character through geometric right-of-way vegetation clearing. Future development including industrial facilities associated with the Narrows Dam and Reservoir, TransWest Express Transmission Project, and the Project would further modify the landscape character through the introduction of industrial structures, access roads, and vegetation clearing.

Viewing Locations

Views from identified viewing locations would have a range of cumulative effects resulting from the addition of the Project in context with past, present, and future actions and to focus on the key issues, this analysis will focus on the 24 simulation locations identified in Table 4-126 along this route grouping.

TABLE 4-126 CUMULATIVE EFFECTS SIMULATION LOCATIONS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES		
Simulation Location (Key Observation Point) Number	Simulation Location (Key Observation Point) Name	Alternative Routes
32	Cedar Mountain Overlook (San Rafael Swell)	COUT BAX-B, COUT BAX-C
41 ¹	Dinosaur Diamond Scenic Byway (U.S. Highway 6)	COUT BAX-C, COUT BAX-E
152	Interstate 70 (I-70) Harley Dome Rest Area (Dinosaur Diamond Scenic Byway)	COUT BAX-B, COUT BAX-C, COUT BAX-E
193	I-70 Crescent Junction Rest Stop (Dinosaur Diamond Scenic Byway)	COUT BAX-B, COUT BAX-C, COUT BAX-E
195	Indian Creek Campground	COUT BAX-B, COUT BAX-C
217 ¹	Skyline Drive Scenic Backway	COUT BAX-B, COUT BAX-C
241	Dinosaur Diamond Scenic Byway in Canyon Pintado NHD (CO SH 139)	COUT BAX-B, COUT BAX-C, COUT BAX-E
244	Garfield County Road 201 (south of Baxter Pass)	COUT BAX-B, COUT BAX-C, COUT BAX-E
260	Energy Loop Scenic Byway (UT SR 31)	COUT BAX-E
261	Fairview residential	COUT BAX-E
262	Mount Pleasant dispersed residences	COUT BAX-B, COUT BAX-C
265	Interstate 15 (Nephi)	COUT BAX-B, COUT BAX-C, COUT BAX-E
279	Old Spanish National Historic Trail (near Thompson Springs, Utah)	COUT BAX-B, COUT BAX-C, COUT BAX-E
282	I-70 Thompson Welcome Center (Dinosaur Diamond Scenic Byway)	COUT BAX-B, COUT BAX-C, COUT BAX-E
284	Energy Loop Scenic Byway (UT SR 264)	COUT BAX-E

TABLE 4-126 CUMULATIVE EFFECTS SIMULATION LOCATIONS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES		
Simulation Location (Key Observation Point) Number	Simulation Location (Key Observation Point) Name	Alternative Routes
305	Wedge Overlook Scenic Backway	COUT BAX-B, COUT BAX-C
306	Upper Colorado River Scenic Byway	COUT BAX-B, COUT BAX-C, COUT BAX-E
309 ¹	Bear Creek Campground	COUT BAX-B, COUT BAX-C
310	Crook’s Brand Rock Art Site	COUT BAX-B, COUT BAX-C, COUT BAX-E
319	Green River	COUT BAX-B, COUT BAX-C, COUT BAX-E
320	Junction of Road to Buckhorn Wash	COUT BAX-B, COUT BAX-C
322	U.S. Highway 6 Rest Area (Dinosaur Diamond Scenic Byway)	COUT BAX-E
323 ¹	Old Railroad Grade (adjacent to Mexican Mountain WSA)	COUT BAX-B
324	Dinosaur Diamond Scenic Byway (U.S. Highway 6 north of Woodside)	COUT BAX-E
NOTES: ¹ Cumulative effect simulation not prepared since the TransWest Express Transmission Project would not be visible in the extent of the direct effect simulation Cumulative simulations are located in Appendix H.		

Key Observation Point Number 32 – Cedar Mountain Overlook (San Rafael Swell) (simulation)

Superior views from the Cedar Mountain Overlook toward the San Rafael Swell have been modified minimally by development except for an existing transmission line, which has similar design characteristics as the Project, but due to its scale and material (wood) does not dominate these views. Through the introduction of the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project, views would begin to be dominated by transmission line structures as well as the geometric features produced by the construction of access roads and vegetation clearing adjacent to the transmission structures as shown in the cumulative effect simulation. Since the view from this overlook focuses on the distant San Rafael Swell landscapes, Alternative COUT BAX-B would have a lower additive effect on these views since it would be located further from the area of focused views. To minimize cumulative effects resulting from both of these transmission projects, potential mitigation would be to colocate with the existing transmission line to the extent practicable. In addition, there is a potential future wind farm located northeast of this viewpoint which would dominate views adjacent to this overlook and on views as recreationists walk back to their car or recreate at the adjacent picnic sites.

Key Observation Point Number 41 – Dinosaur Diamond Scenic Byway (U.S. Highway 6)

Long-duration views along this scenic byway have been influenced by existing modifications including a transmission line and railroad line, but due to the relative scale of these features, they do not dominate views from the scenic byway. Through the development of the Project (Alternatives COUT BAX-C and COUT BAX-E) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, motorists traveling along this scenic backway would experience a tunnel-effect since these two proposed projects are located on opposite sides of the road. Since the direct-effect simulation does not include the area west of the road, where the TransWest

Express Transmission Project is located, this cumulative effect was not simulated. To minimize the expansion of the area viewed as a utility corridor, and as modified, mitigation would include colocation of the two transmission projects on the east of the existing transmission line to the extent practicable and share construction access if feasible. By placing these two transmission projects closer to the Book Cliffs landscape, the complex backdropping condition, based on strong topographical features, can be used to reduce the visual dominance of these projects.

Key Observation Point Number 152 – Interstate 70 Harley Dome Rest Area (Dinosaur Diamond Scenic Byway) (simulation)

Views from this rest area have few visible modifications to the northwest, toward the Project, but it is important to note, I-70 and the rest area's parking lot are located to the south of this viewpoint. The introduction of the Project (all alternative routes in this route grouping) and the TransWest Express Transmission Project, both located more than 1 mile away, would begin to dominate views from this rest area and overlook as shown in the cumulative-effect simulation. Due to intermittent topographic screening and backdropping by the distant Tavaputs Plateau landscape (including the Book Cliffs), the two proposed transmission line projects would not dominate these views.

Key Observation Point Number 193 – Interstate 70 Crescent Junction Rest Stop (Dinosaur Diamond Scenic Byway) (simulation)

Existing development has modified views from the Crescent Junction Rest Stop including I-70 as well as through the potential introduction of additional industrial structures, which would be expanded through further development of adjacent oil and gas lease areas. The Project (all alternative routes in this route grouping) and the TransWest Express Transmission Project would further industrialize this area through the construction of a series of transmission line structures which would begin to dominate views from this overlook as shown in the cumulative effect simulation. In particular the TransWest Express Transmission Project, which is located approximately 0.5 mile away, would further modify the landscapes adjacent to this viewpoint whereas the Project would be located approximately 1 mile away. To reduce the cumulative effect introduced by both of these projects, potential mitigation would be to colocate closer to the Book Cliffs to use the complex backdropping afforded by that landscape to the extent practicable.

Key Observation Point Number 195 – Indian Creek Campground (simulation)

Views from this campground are enclosed with the adjacent existing transmission line being mostly screened by vegetation, which produces a nearly intact appearing landscape character. If existing BLM Price Field Office oil and gas leases were to be developed, views may become more influenced by development if wells were located on ridges or other high points in view of the campground. Transmission structures associated with the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project would be visible over the trees, which screen views of the existing transmission line, due to the proximity of these projects to the campground and the height of the proposed structures as shown in the cumulative effect simulation. To reduce cumulative effects on these views, potential mitigation would be to colocate the two transmission projects as close to the existing transmission line as practicable. It is important to note that the alignment for the TransWest Express Transmission Project was modified to be located 1,500 feet south of the existing transmission line for the simulation due to multiple crossings of the Project alignment. As such, the simulation illustrates that the TransWest Express Transmission Project would be mostly screened from view.

Key Observation Point Number 217 – Skyline Drive Scenic Backway

From this viewpoint along the Skyline Drive Scenic Backway, views are modified minimally by existing development compared to the area approximately 0.75 mile south of this location where an existing

transmission line crosses the scenic road. Due to topographic screening, the existing transmission line has a localized effect on the scenic drive and based on the relative scale and construction materials (wood), the existing transmission line does not dominate these views. Similar to the description for Indian Creek Campground, the BLM Richfield Field Office has oil and gas leases in the area and if developed, would introduce additional structures inconsistent with the existing landscape character. Through the addition of the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, the area north of the existing transmission line would become dominated by transmission lines including their associated construction access roads and right-of-way vegetation clearing. By expanding the area influenced by these utility projects, views may become industrialized along this portion of the Skyline Drive Scenic Backway. To reduce the cumulative effect on these views, the two transmission projects could be colocated with the existing transmission line in Dry Pole Fork Canyon to limit the visibility of transmission lines projects from this scenic road. Note that, based on the current alignment for the TransWest Express Transmission Project, which crosses the Project multiple times in this area, the TransWest Express Transmission Project was relocated 1,500 feet south of the existing transmission line and, therefore, would not be visible from this viewpoint.

Key Observation Point Number 241 – Dinosaur Diamond Scenic Byway in Canyon Pintado National Historic District (CO SH 139) (simulation)

Views along this portion of the Dinosaur Diamond Scenic Byway generally are intact with few visible cultural modifications as the existing transmission line is screened by the adjacent ridge landscapes. The introduction of the Project (all alternative routes in this route grouping) and the TransWest Express Transmission Project would dominate views from this location due to their proximity and visibility, in particular the Project which would be skylined on the ridge east of the scenic road as shown in the cumulative effect simulation. To reduce cumulative effects on the scenic road, as well as views from the Canyon Pintado NHD, potential mitigation would include colocation of the two transmission projects adjacent to the existing transmission line where existing topographic screening can be used to the extent practicable.

Key Observation Point Number 244 – Garfield County Road 201 (south of Baxter Pass) (simulation)

Views along Garfield County Road 201, which provides access to the Demaree and Oil Spring wilderness study areas, have been modified by the presence of existing pipelines which have produced areas of geometric right-of-way vegetation clearing adjacent to the road. Through the addition of the Project (all alternative routes in this route grouping) and the TransWest Express Transmission Project, views from this road would become dominated by the presence of industrial, utility development including the introduction of transmission structures, additional right-of-way vegetation clearing, and construction access roads as shown in the cumulative effect simulation. Due to the separation between the Project and the TransWest Express Transmission Project in the narrow West Salt Creek Canyon, one project would likely need to be located on top of the steep canyon walls instead of being located on flat canyon floor. The presence of skylined structures across the top of the canyon would further dominate views and to reduce cumulative effects on these views, potential mitigation would include colocation of the two transmission projects along the canyon floor to the extent practicable.

Key Observation Point Number 260 – Energy Loop Scenic Byway (UT SR 31) (simulation)

Motorists driving the Utah State Route 31 portion of the Energy Loop Scenic Byway would view areas along Cottonwood Creek that have been influenced minimally by development. Through the addition of the Project (Alternative COUT BAX-E) and the TransWest Express Transmission Project, views would begin to become dominated by transmission line facilities including transmission line structures,

associated access roads, and right-of-way vegetation clearing as shown in the cumulative effect simulation. Since the TransWest Express Transmission Project parallels the scenic byway for approximately 2.5 miles, whereas the Project crosses the road and is located approximately 0.5 mile away from the road where views toward the Project would be partially screened, potential mitigation would include colocation of the two projects north of the scenic byway to reduce the cumulative effect on these views.

Key Observation Point Number 261 – Fairview Residential (simulation)

Views from residences in the community of Fairview have been modified where existing development is located between the viewer and the Wasatch Plateau (as shown in the visual simulation). Other than the existing development in and around Fairview, the character of the Wasatch Plateau, as viewed from Fairview, has been modified minimally by development. Through the introduction of the Project (Alternative COUT BAX-E) and the TransWest Express Transmission Project, views from Fairview would be influenced by the associated transmission line structures, right-of-way vegetation clearing, and access roads as shown in the cumulative effect simulation. Due to the distance between the viewpoint and these projects, approximately 2 miles, these two projects would not dominate views from Fairview.

Key Observation Point Number 262 – Mount Pleasant Dispersed Residences (simulation)

The area of dispersed residences east of Mount Pleasant have views, which have been modified by the existing transmission line that traverses the Wasatch Plateau through the presence of transmission line structures and right-of-way vegetation clearing. Due to the relative scale and construction materials (wood) of the existing transmission line, it does not dominate views from these residences. Through the introduction of the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project into this area, which have design characteristics in common with the existing transmission line, views would become dominated by three transmission lines which would locate many residences between each subsequent transmission line as shown in the cumulative effect simulation. In other words, residences would have views of transmission lines looking both to the northeast and southwest, creating a type of tunnel-effect. As such, potential mitigation would be to colocate the two proposed transmission lines with the existing transmission line to the extent practicable to reduce cumulative effects on views from these residences.

Key Observation Point Number 265 – Interstate 15 (Nephi) (simulation)

Motorists driving I-15 near Nephi have views that have been modified by existing development including several transmission lines, development in and around Nephi, and the interstate highway itself. These existing modifications begin to dominate views, especially north of Nephi, producing a landscape character viewed as industrial in nature. Through the introduction of the Project (all alternative routes in this route grouping) and the TransWest Express Transmission Project, which have similar design characteristics compared to the existing transmission lines, views from I-15 north of Nephi would be dominated by transmission lines including several skylined transmission structures which further dominate views due to their visibility on ridges as shown in the cumulative effect simulation. To minimize cumulative effects on these views, the two proposed transmission projects could be colocated with the existing transmission lines and use topographic screening opportunities to the extent practicable.

Key Observation Point Number 279 – Old Spanish National Historic Trail (near Thompson Springs, Utah) (simulation)

Views from the Old Spanish NHT have been modified by the railroad line to the north and I-70 to the south. These modifications do not dominate views but have diminished the integrity of this area which may be further modified as a result of development of areas leased for oil and gas production. With the

addition of the Project (all alternative routes in this route grouping) and the TransWest Express Transmission Project, these views would be modified further and dominated by transportation and utility infrastructure including the presence of tall, transmission line structures as shown in the cumulative effect simulation. Views to the north, toward the Book Cliffs, offer a complex backdropping element, which reduces dominance of lattice transmission structures as they begin to blend visually with this landscape. To reduce cumulative effects further, the two transmission projects should be colocated north of the railroad line to the extent practicable to minimize the extent of the area viewed as a utility corridor along this nationally significant viewing location.

Key Observation Point Number 282 – Interstate 70 Thompson Welcome Center (Dinosaur Diamond Scenic Byway) (simulation)

Similar to the description for the adjacent KOP No. 279, views from the Thompson Welcome Center have been modified by the existing railroad line and interstate. Views from this location toward the north are partially screened by topography which would reduce the dominance of future development including the Project and the TransWest Express Transmission Project as shown in the cumulative effect simulation. Therefore, views north toward the Book Cliffs would begin to be dominated by development but would not be completely dominated.

Key Observation Point Number 284 – Energy Loop Scenic Byway (UT SR 264) (simulation)

Motorists driving the Utah State Route 264 portion of the Energy Loop Scenic Byway have views minimally modified by development except for the cluster of summer homes located to the south. Through the introduction of the Project (Alternative COUT BAX-E) and the TransWest Express Transmission Project, views along this portion of the Energy Loop Scenic Byway would begin to become dominated by transmission line structures and potentially through associated right-of-way vegetation clearing as shown in the cumulative-effect simulation. To minimize the cumulative effect on these views of two geometric cleared rights-of-way, potential mitigation would include colocation of the two transmission projects east of the aspen groves, visible in the simulation, to the extent practicable. It is important to note that a future reservoir is planned to be located in this area, the Narrows Reservoir, which would require the scenic byway to be relocated to the north. The future reservoir itself may increase landscape variety and be seen as a positive cumulative effect but based on the final alignment for the highway, this realignment may cause additional cumulative effects on views from the scenic byway as a result of longer duration views of the previously mentioned transmission line projects including the Project.

Key Observation Point Number 305 – Wedge Overlook Scenic Backway (simulation)

Views from this portion of the scenic backway have been minimally modified by development including an existing transmission line located approximately 2.5 miles away, which due to its scale and construction materials (wood), does not dominate these views. Future development in this area is limited mostly to the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project. Since these two transmission projects are planned to be located more than 2 miles from this viewpoint, the presence of these three transmission lines would begin to dominate views, but due to the backdropping afforded by Cedar Mountain, the structures would not completely dominate these views as shown in the cumulative effect simulation. To reduce cumulative effects on views from this scenic backway, potential mitigation would include colocation the two proposed transmission lines as close to the existing transmission line as practicable.

Key Observation Point Number 306 – Upper Colorado River Scenic Byway (simulation)

Motorists driving this portion of the Upper Colorado River Scenic Byway would have views modified by existing development including an adjacent communication facility, I-70, and a railroad line located approximately 0.5 mile away. If oil and gas wells are placed on active Utah SITLA-administered oil and gas leases adjacent to the scenic road, this area would be further influenced by infrastructure development. With the addition of the Project (all alternative routes in this route grouping) and the TransWest Express Transmission Project, views from this portion of the scenic byway would become dominated by development, in particular the introduction of several transmission line structures approximately 0.5 mile away as shown in the cumulative effect simulation. To minimize cumulative effects on these views, the two transmission projects could be colocated further to the north where the complex backdropping afforded by the distant Book Cliffs could be used to reduce dominance of the proposed transmission lines structures.

Key Observation Point Number 309 – Bear Creek Campground

Views from this campground have been modified by several transmission lines, the Huntington power plant, and existing and leased oil and gas development. It is important to note that due to the enclosed views from in the southern portion of the campground, where the simulation was developed, these existing modifications are not visible whereas views at the entrance of the campground are dominated by these existing features. Through the introduction of the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project, views would be affected minimally where the existing industrial modifications are visible but where enclosed views in the campground would only view the two proposed transmission projects in steep terrain approximately 2 miles away, these views would be influenced by energy-related development. In particular, repeating transmission lines structures, right-of-way vegetation clearing, and construction access roads would be visible near the ridgeline. Due to the overlap of the proposed alignments for the Project and the TransWest Express Transmission Project, the TransWest Express Transmission Project was relocated 1,500 feet south of the Project and, therefore, would not be visible from this viewpoint.

Key Observation Point Number 310 – Crook's Brand Rock Art Site (simulation)

Views from this rock art site, including the associated recreation area, have been influenced by adjacent oil and gas development which may be enlarged through continued expansion of oil and gas wells onto existing lease areas. These existing features do not dominate views from this location and typically are screened by adjacent vegetation except from elevated viewpoints. With the addition of the Project (all alternative routes in this route grouping) approximately 0.5 mile away and the TransWest Express Transmission Project approximately 1 mile away, these two transmission lines would begin to dominate views from this site through the addition of tall transmission line structures which would rise above the pinyon-juniper vegetation present in this area as shown in the cumulative effect simulation. To minimize cumulative effects on views from this rock art site, the two projects should be colocated further from this site, to the extent practicable, which would reduce the visual dominance of these projects using additional screening and backdropping opportunities.

Key Observation Point Number 319 – Green River (simulation)

Recreationists along this portion of the Green River have views influenced by an existing transmission line, which due to its relative scale and construction materials (wood), does not dominate views. Adjacent areas leased for oil and gas development would further influence views along the Green River but would likely be screened from view in this area. With the addition of the Project (all alternative routes in this route grouping) and the TransWest Express Transmission Project, views would begin to be dominated by transmission line structures. In particular, structures may be skylined on high points, which would further

dominate views from the Green River as shown in the cumulative effect simulation. To reduce the cumulative effect on these views, potential mitigation would be to colocate the two proposed transmission lines with the existing transmission line, in an area where the number of skylined structures would be minimized, to the extent practicable.

Key Observation Point Number 320 – Junction of Road to Buckhorn Wash (simulation)

Similar to description for the adjacent KOP No. 305, this viewpoint has views influenced by an existing transmission line except due to the proximity to the existing transmission line, approximately 1 mile away; views are more dominated by the repeating pattern of transmission lines structures than from KOP No. 305. The backdropping afforded by Cedar Mountain would reduce the dominance of these proposed projects as the lattice structures would begin to blend with the complex forms found on the southern edge of Cedar Mountain as shown in the cumulative-effect simulation. To minimize cumulative effects on views in this area, through the addition of the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project, the three transmission lines should be colocated to the extent practicable, which would reduce the visual dominance of these transmission line structures.

Key Observation Point Number 322 – U.S. Highway 6 Rest Area (Dinosaur Diamond Scenic Byway) (simulation)

Views from this rest area have been modified by its associated facilities, U.S. Highway 6, and an existing transmission line located approximately 1 mile away. From this location, these features do not dominate views but through potential development of areas leased for oil and gas wells, existing development would have a more dominant effect on views. Through the introduction of the Project (Alternative COUT BAX-E) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, views would be further modified and would begin to be dominated by infrastructure development as shown in the cumulative effect simulation. Due to the location of both of these transmission projects, located further from the viewer than the existing transmission line as well as opportunities for backdropping the structures, these two projects would not extensively expand the area viewed from this rest area as influenced by development. In addition, views from the rest area are screened intermittently toward the area potentially traversed by these two transmission lines projects which further reduces their anticipated level of dominance.

Key Observation Point Number 323 – Old Railroad Grade (adjacent to Mexican Mountain Wilderness Study Area)

Views from Cottonwood Wash Road, which parallels the Old Railroad Grade, have been modified by an existing transmission line. Due to the scale of the existing transmission line and construction materials (wood), views would begin to become dominated by this feature but would not completely dominate views. Construction of wells, and associated facilities, on lands leased for oil and gas development would be mostly screened by topography from this viewpoint. Due to adjacent topographic screening, views of the future power generation facility at the Woodside site would be screened from view and the only visible modification would be the associated plume during particular weather conditions. The addition of the Project (Alternative COUT BAX-B) would introduce additional transmission lines structures, which have similar design characteristics and when seen in context with the existing transmission line, would dominate views in this area as shown in the cumulative effect simulation. In particular, the transmission line structures running parallel with the road producing long duration views looking down the corridor. Please note the TransWest Express Transmission Project does not have a colocated route in this area.

Key Observation Point Number 324 – Dinosaur Diamond Scenic Byway (U.S. Highway 6 north of Woodside) (simulation)

Motorists driving this portion of U.S. Highway 6, part of the Dinosaur Diamond Scenic Byway, would have long duration views of an existing transmission line and railroad line, but due to the relative scale of these features, they do not dominate views from the scenic byway. Areas leased for oil and gas wells, if developed, would further influence views from the scenic byway. The future power generation facility at the Woodside site would dominate views along this portion of the scenic byway through the introduction of a large-scale industrial facility directly adjacent to the scenic byway. The Project (Alternative COUT BAX-E) and the proposed TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, would increase the level of dominance produced by energy-related development adjacent to the Dinosaur Diamond Scenic Byway as shown in the cumulative effect simulation. To minimize cumulative effects in this area, potential mitigation would be to colocate the two proposed transmission lines with the existing transmission line, instead of having one project located on each side of the highway as currently designed. To further reduce cumulative effects, the two projects should cross the highway adjacent to the proposed Woodside site so the scenic byway crossing would occur in this area of more intense potential industrial development instead of being in an area with less influence from industrial facilities.

4.3.16.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Scenery

Table 4-127 lists the cumulative effects for the COUT alternative routes.

Issue Areas

Scenery issues, as described in the direct Project effects discussion in Chapter 3, include the following landscapes (SQRUs):

- Argyle Canyon
- Bad Land Cliffs
- Green River
- Strawberry River
- Tavaputs Plateau
- Wasatch Plateau Alpine
- Wasatch Plateau
- Wasatch Plateau Parks

In addition through the analysis of cumulative effects on scenery, Book Cliff Bench, Emma Park/Kyune, and Windy Ridge were identified as SQRUs where the Project's area influence includes many areas not influenced by past, present, or other future actions.

Effects

Due to the presence of existing development and proposed future development, including but not limited to the TransWest Express Transmission Project, there are locations where entire scenery units would be influenced by past, present, and RFFAs. As analyzed these landscapes (SQRUs) include Bonanza/Dripping Rock Creek, Flattop Butte, Fruitland, Pariette Bench, Red Wash/Kennedy Wash/Devil's Playground, Southern Bridgeland, Strawberry River, Walker Plateau West, and Wrinkles Road. These landscapes have been modified by existing and areas leased for oil and gas development, existing transmission lines and pipelines, and in the case of the Bonanza/Dropping Rock Creek SQRU, the Bonanza power plant.

TABLE 4-127 SCENERY CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Scenery Units not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
Alternative COUT-A and Route Variation							
COUT-A	3,301,500	2,679,100	74,700	1,200	2,755,000	546,500	16.6
COUT-A-1	3,301,500	2,679,100	74,700	900	2,754,700	546,800	16.5
Alternative COUT-B and Route Variations							
COUT-B	3,908,600	3,090,600	212,600	700	3,304,000	604,600	15.5
COUT-B-1	3,841,600	3,036,600	204,000	700	3,241,400	600,100	15.6
COUT-B-2	3,841,600	3,036,600	204,000	700	3,241,400	600,100	15.6
COUT-B-3	3,841,600	3,036,600	204,000	700	3,241,400	600,100	15.6
COUT-B-4	3,841,600	3,036,600	204,000	700	3,241,400	600,100	15.6
COUT-B-5	3,841,600	3,036,600	204,000	700	3,241,400	600,100	15.6
Alternative COUT-C and Route Variations							
COUT-C	4,010,700	2,909,500	248,900	400	3,158,900	851,800	21.2
COUT-C-1	3,943,700	2,855,600	240,300	500	3,096,400	847,300	21.5
COUT-C-2	3,943,700	2,855,600	240,300	500	3,096,400	847,300	21.5
COUT-C-3 (Agency Preferred Alternative)	3,943,700	2,855,600	240,300	400	3,096,400	847,300	21.5
COUT-C-4	3,943,700	2,855,600	240,300	400	3,096,400	847,300	21.5
COUT-C-5	3,943,700	2,855,600	240,300	400	3,096,400	847,300	21.5
Alternatives COUT-H and COUT-I							
COUT-H (Applicant Preferred Alternative)	4,352,300	3,237,500	255,200	300	3,493,000	859,300	19.7
COUT-I	4,363,200	3,219,600	277,600	11,300	3,508,600	854,600	19.6
NOTES: ¹Area of scenery units not influenced by development Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.							

The alternative routes (including route variations), in this route grouping, are similar in regard to overall cumulative effects except for Alternative COUT-I. As described above due to the colocation on most alternative routes of the Project and the TransWest Express Transmission Project, most areas would already have been influenced by the TransWest Express Transmission Project and the addition of the Project would only intensify the cumulative effect on scenery. Since there is not an adjacent TransWest Express Transmission Project alternative route descending the Book Cliffs into Castle Valley, east of Wellington, Utah, the Project would extend the areas influenced by development through the construction and operation of the Project.

Argyle Canyon and Bad Land Cliffs

As delineated by the BLM Vernal and Price Field Offices, the Argyle Canyon and Jack Canyon WSA SQRUs contain Argyle Canyon and the Bad Land Cliffs, as well as a portion of Nine Mile Canyon east of Argyle Canyon and the area between Reservation Ridge and Emma Park. This landscape unit contains limited existing development except for a pipeline crossing the southeast corner of the landscape, a transmission line bisecting the landscape, and dispersed summer cabins. In addition, oil and gas leases are located on state-administered lands in this scenery unit which if developed, would modify the landscape

character through the introduction of additional structures and associated access roads. Due to several alternative routes for both the Project (Alternatives COUT-B, COUT-C, COUT-H, and COUT-I including all route variations) and the TransWest Express Transmission Project, a major portion of this landscape unit may become visually modified. By collocating the Project and TransWest Express with existing modifications along either Alternative COUT-B, COUT-C, COUT-H, or COUT-I, cumulative effects on this scenery unit would be minimized by limiting the expansion of areas influenced by development. Whereas either not collocating the two transmission projects or collocating along Route Variation COUT-B-1 or COUT-C-1, the area influenced by development would extend across a majority of this landscape unit.

Book Cliff Bench

This SQRU, as digitized by the BLM Price Field Office, would only be crossed by Alternative COUT-I and would be influenced by Alternative COUT-H. Existing development, including oil and gas (existing and leased areas) as well as a transmission line and pipeline, have visually influenced approximately 80 percent of this landscape. As stated earlier, since the TransWest Express Transmission Project does not have an alternative route adjacent to Alternative COUT-I, the Project would extend the influence of development in this landscape by approximately 8 percent through the introduction of transmission line structures, access roads, and right-of-way vegetation clearing. Due to the colocation of the Project on Alternative COUT-H with the TransWest Express Transmission Project, no additional areas would be influenced by the Project but instead, a more intense cumulative effect on scenery is anticipated due to the presence of two additional transmission lines in the Book Cliff Bench SQRU.

Emma Park/Kyune

This landscape represents the area known as Emma Park which is located between the Book Cliffs and Reservation Ridge and includes SQRUs delineated by the BLM Price, Vernal, and Salt Lake Field Offices. Similar to the description of existing and future development for the Book Cliffs Bench, existing and leased areas for oil and gas development, an existing pipeline, two existing transmission lines, and other industrial facilities have influenced the majority of this landscape. Due to the colocation of the Project with the TransWest Express Transmission Project in this area along Alternatives COUT-B (including route variations), COUT-C (including route variations), and COUT-H, there are no additional areas that would be influenced by the Project, which would not be influenced by past, present, or future actions. Similar to the Book Cliffs Bench SQRU, Alternative COUT-I would influence an additional 3 percent of this landscape due to there not being an adjacent TransWest Express Transmission Project alternative.

Green River

The BLM Vernal Field Office delineated two different SQRUs to represent the Green River—Horseshoe Bend and South Green River. Alternatives COUT-A (including route variation) and COUT-B (including route variations) cross the Horseshoe Bend unit and Alternatives COUT-C (including route variations), COUT-H, and COUT-I cross the South Green River unit. Both of these landscapes have been influenced visually by existing and areas leased for oil and gas development as well as existing major linear utilities (transmission line across the Horseshoe Bend landscape and multiple pipelines crossing the South Green River). In addition, the TransWest Express Transmission Project shares similar alternative routes with the Project and to minimize cumulative effects on the Green River, the two transmission project should be colocated to the extent practicable.

Strawberry River

The scenery adjacent to the Strawberry River from Solider Creek Dam to Starvation Reservoir was delineated as one scenery unit with landscape character modifications primarily located along the western portion of the landscape. These existing modifications include a transmission line and the Solider Creek Dam. It is important to note that the Bill Barrett Lake Canyon EDA, an area leased for oil and gas development, completely overlaps the Strawberry River scenery unit. As such, this landscape may become modified along its entire length through the introduction of oil- and gas-related facilities. In addition to the existing transmission line along the west side of this landscape, the Project (Alternative COUT-A) as well the TransWest Express Transmission Project would further industrialize the area adjacent to the Solider Creek Dam and modify the existing landscape character through the presence of several transmission line structures, access roads, and right-of-way vegetation clearing.

Tavaputs Plateau

The Tavaputs Plateau scenery unit contains a major portion of the Duchesne Ranger District on the Ashley National Forest as well as the lands north toward U.S. Highway 40 including the area north of Reservation Ridge. Existing development is primarily located along the northern portion of Sowers Canyon including oil and gas wells and a transmission line which have locally modified the landscape character. In addition, several oil and gas permitted areas overlap this landscape and if fully developed, would begin to produce an industrialized landscape character. This industrial character would be expanded through the introduction of the TransWest Express Transmission Project and the Project, especially along Alternative COUT-B, which bisects the scenery unit. Route Variations COUT-B-1 and COUT-C-1 would further influence the character of the Tavaputs Plateau along the top of Reservation Ridge through steep, forested terrain.

Wasatch Plateau Alpine

This scenery unit was digitized to represent the western ridgeline of the Wasatch Plateau above the community of Mount Pleasant. Other than an existing transmission line, which crosses the ridge, there are few existing landscape character modifications. The majority of this area has been leased by the Richfield Field Office for oil and gas development, which would further modify the landscape character. The addition of the Project (Alternative COUT-I) and the TransWest Express Transmission Project would begin to industrialize the area above Potters Pond through the presence of transmission line structures, access roads, and geometric right-of-way vegetation clearing. To reduce cumulative effects on this narrow scenery unit, the two proposed transmission lines should be located as close as practicable to the existing transmission line.

Wasatch Plateau

The scenery unit that comprises the northern portion of the Wasatch Plateau covers a large portion of the Manti-La Sal National Forest from U.S. Highway 6 to Joes Valley Reservoir. As such, there are areas of more intense existing development and areas with limited landscape character modifications. Existing modifications include surface facilities associated with underground coal mining, existing transmission lines and pipelines, and areas leased for oil and gas development. With the addition of the TransWest Express Transmission Project into this scenery unit, the Project along Alternatives COUT-H and COUT-I would not visually influence additional areas that have not already been influenced by past or present actions; whereas the other alternative routes in this routing group would visually influence approximately 200 additional acres. The presence of the Project, including the transmission line structures, access roads, and right-of-way vegetation clearing, would produce a more intense localized cumulative effect on scenery if the Project were colocated with TransWest Express and the existing transmission line along Alternative COUT-A (including route variation), COUT-B (including route variations), COUT-C

(including route variations), or COUT-I. Whereas if the Project and the TransWest Express Transmission Project were not colocated, there would be a more diffuse but widespread cumulative effect on the Wasatch Plateau landscape in context with other past, present, and future actions.

Wasatch Plateau Parks Landscape

There are two park landscape located on the Wasatch Plateau with the area known as Scad Valley, which would be crossed by Alternative COUT-I, and the park adjacent to Gooseberry Creek (Gooseberry Creek valley), which would be crossed by Alternative COUT-H. Scad Valley has few existing cultural modifications except for the presence of an existing transmission line but through development of oil and gas lease areas as well as coal lease areas; this landscape has the potential to become industrialized. In addition to the past and present development in Scad Valley, the introduction of the Project and the TransWest Express Transmission Project would further industrialize the southern portion of this landscape unit through the presence of transmission line structures, access roads, and right-of-way vegetation clearing. The other park landscape, Gooseberry Creek valley, has fewer existing landscape character deviations than Scad Valley, except for oil and gas lease areas along the eastern edge of this scenery unit. An existing pipeline is located along the northern edge of the landscape which has modified the local character through geometric right-of-way vegetation clearing. Future development including industrial facilities associated with the Narrows Dam and Reservoir, TransWest Express Transmission Project, and the Project would further modify the landscape character through the introduction of industrial structures, access roads, and vegetation clearing.

Windy Ridge

This landscape was delineated to represent a ridge between Roosevelt, Utah, and the Duchesne River. Adjacent oil and gas development has a limited visual influence on this landscape as there are no wells located on Windy Ridge. An existing transmission line has influenced approximately half of this scenery unit and with the addition of the Project (Alternatives COUT-A and COUT-B, including route variations) as well as the TransWest Express Transmission Project; the influence of development would be extended further into this landscape. Due to the separation between the Project and the TransWest Express Transmission Project, the Project would influence an additional 4 percent of this landscape as well as producing a more intense, industrialized landscape character along the northern portion of this landscape as a result of the presence of three transmission lines.

Viewing Locations

Views from identified viewing locations would have a range of cumulative effects resulting from the addition of the Project in context with past, present, and future actions and to focus on the key issues, this analysis will focus on the 22 simulation locations identified in Table 4-128 along this route grouping.

TABLE 4-128 CUMULATIVE EFFECTS SIMULATION LOCATIONS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES		
Simulation Location (Key Observation Point) Number	Simulation Location (Key Observation Point) Name	Alternative Routes
87	Enron Recreation Area (on White River)	COUT-C and route variations, COUT-H, COUT-I
109 ¹	Dispersed residences south of Roosevelt	COUT-A and COUT-B and route variations
195	Indian Creek Campground	COUT-I
200 ¹	Argyle Canyon Road	COUT-C and route variations, COUT-H, COUT-I

TABLE 4-128 CUMULATIVE EFFECTS SIMULATION LOCATIONS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES		
Simulation Location (Key Observation Point) Number	Simulation Location (Key Observation Point) Name	Alternative Routes
203	Fourmile Bottom	COUT-C and route variations, COUT-H, COUT-I
208	West Helper residential	COUT-H
211	Dinosaur Visitor Center	COUT-A, COUT-B, and COUT-C and route variations; COUT-H; COUT-I
217 ¹	Skyline Drive Scenic Backway	COUT-I
260	Energy Loop Scenic Byway (Utah State Route 31)	COUT-H
261	Fairview residential	COUT-H
262	Mount Pleasant dispersed residences	COUT-I
265	Interstate 15 (Nephi)	COUT-A, COUT-B, and COUT-C and route variations; COUT-H; COUT-I
266	U.S. Highway 6 (Spanish Fork Canyon)	COUT-A, COUT-B, and COUT-C and route variations
269 ¹	Fruitland residential	COUT-A and route variation
272	Sand Wash North Destination Route	COUT-C and route variations, COUT-H, COUT-I
274	Indian Canyon Scenic Byway (U.S. Highway 191)	COUT-H
284	Energy Loop Scenic Byway (Utah State Route 264)	COUT-H
285	Aspen Grove Campground	COUT-A and route variation
304	Sheep Creek Road (Forest Road 042)	COUT-A and route variation
309 ¹	Bear Creek Campground	COUT-I
325 ¹	Argyle Canyon residences	COUT-B and route variations
328	Indian Canyon Scenic Byway	Route variations COUT-A-1 and COUT-B-1
NOTES: ¹ Cumulative effect simulation not prepared since the TransWest Express Transmission Project would not be visible in the area of the direct effect simulation Cumulative effects simulations are located in Appendix H.		

Key Observation Point Number 87 – Enron Recreation Area (on White River) (simulation)

Recreationists at this campground and river put-in on the White River have views that have been minimally influenced by development due to the enclosed views in this area. Existing oil and gas development is located on the plateaus above the river but is screened from view at this recreation area. If wells, as part of permitted oil and gas leases, were to be developed adjacent to the river, views would become influenced by these wells including the introduction of industrial structures. Through the development of the Project (Alternatives COUT-C [including route variations], COUT-H, and COUT-I) and the TransWest Express Transmission Project, views would become dominated by transmission lines including the presence of multiple skylined transmission structures on adjacent ridgelines as shown in the cumulative effect simulation. To reduce cumulative effects on views from this recreation area, potential mitigation would include colocation of the two projects, maximizing the distance between transmission structures at the river crossing, to the extent practicable, to minimize the number and visibility of proposed transmission line structures.

Key Observation Point Number 109 – Dispersed Residences South of Roosevelt

Views from dispersed residences south of the community of Roosevelt have views modified by existing rural development including agricultural fields, dispersed residences, and associated utilities. Residences adjacent to the existing transmission line in this area have locally modified views that diminish based on distance from the existing transmission line as well as through topographic screening. In the location where the simulation was developed looking south, the existing transmission line is not visible and is located approximately 0.5 mile to the north. As such, views from this group of residences have been modified minimally by development. The introduction of the Project (Alternatives COUT-A and COUT-B including all route variations) and the TransWest Express Transmission Project (located north of the viewpoint and also not shown in the simulation), which both have design characteristics in common with the existing transmission line, would further modify views from dispersed residences and due to the separation between each subsequent transmission line, residences would be located in between transmission lines producing a wide area viewed as a transmission line corridor. To reduce cumulative effects on these dispersed residences, colocation of the two proposed transmission lines with the existing transmission line would intensify cumulative effects for some residences, located adjacent to the existing transmission line, but would diminish the overall extent of the cumulative effects through the widening of this transmission line corridor.

Key Observation Point Number 195 – Indian Creek Campground (simulation)

Views from this campground are enclosed with the adjacent existing transmission line being mostly screened by vegetation which produces a nearly intact appearing landscape character. If existing BLM Price Field Office oil and gas leases were to be developed, views may become more influenced by development if wells were located on ridges or other high points in view of the campground. Transmission structures associated with the Project (Alternative COUT-I) and the TransWest Express Transmission Project would be visible over the trees, which screen views of the existing transmission line, due to the proximity of these projects to the campground and the height of the proposed structures as shown in the cumulative effect simulation. To reduce cumulative effects on these views, potential mitigation would be to colocate the two transmission projects as close to the existing transmission line as practicable. It is important to note that the alignment for the TransWest Express Transmission Project was modified to be located 1,500 feet south of the existing transmission line for the simulation due to multiple crossings of the Project alignment. As such, the simulation illustrates that the TransWest Express Transmission Project would be mostly screened from view.

Key Observation Point Number 200 – Argyle Canyon Road

Views along this portion of the Argyle Canyon Road have been modified minimally by development except for a few dispersed residences and associated agricultural fields which produce a rural character in this area. The introduction of the Project (Alternatives COUT-C [including route variations], COUT-H, and COUT-I) and the TransWest Express Transmission Project (not visible in simulation since that project would cross the canyon 1 mile northeast of the simulation location) would produce highly modified views along this portion of Argyle Canyon Road. These modifications are a result of several skylined transmission structures, right-of-way vegetation clearing, and a complex network of roads to access the structure pads on very steep terrain. To minimize cumulative effects on views from the road, as well as adjacent residences, the two transmission project should be colocated and perpendicularly cross Argyle Canyon instead of paralleling the road for approximately 2 miles.

Key Observation Point Number 203 – Fourmile Bottom (simulation)

Recreationists at the Fourmile Bottom put-in, as well as floating this portion of the Green River, have views intermittently influenced by development. These include views of an existing pipeline corridor and

potential views of existing and/or areas leased for oil and gas development where the adjacent canyon walls are shorter and do not screen views from the river. Through the introduction of the Project (Alternatives COUT-C [including route variations], COUT-H, and COUT-I) and the TransWest Express Transmission Project, views at and adjacent to the Fourmile Bottom put-in would be modified by skylined transmission structures and access road construction in steep terrain as shown in the cumulative effect simulation. To reduce cumulative effects on these views, potential mitigation would include colocation of the two transmission projects and maximizing the distance between structures at the river crossing to the extent practicable. By placing the structures at the edge of the canyon walls, no structures would be placed adjacent to the river, which would decrease the cumulative effect on these views.

Key Observation Point Number 208 – West Helper Residential (simulation)

Views from residences in Spring Canyon, west of Helper, have been modified by existing utilities and an elevated railroad road line located west of this group of residences. These modifications influence but do not dominate the views from this location. The addition of the Project (Alternative COUT-H) and the TransWest Express Transmission Project would produce views which would begin to be dominated by transmission lines including a skylined transmission structure located on the ridge adjacent to these residences as well as through the construction of access roads and right-of-way vegetation clearing as shown in the cumulative effect simulation. To minimize cumulative effects on these views, the two transmission line projects could be colocated adjacent to the existing railroad line, which would offer partial screening opportunities and, therefore, reduce effects on views from these residences.

Key Observation Point Number 211 – Dinosaur Visitor Center (simulation)

Views from the Dinosaur National Monument Visitor Center in Colorado have been influenced by an existing transmission line and U.S. Highway 40, but these features do not dominate views from the visitor center. Note there is another, larger transmission line which is mostly screened by the ridge visible in the simulation but is seen in a skylined condition approximately 6 miles away. Through the addition of the Project (all alternative routes in this route group) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, views would begin to become dominated by transmission lines, in particular through the introduction of skylined transmission structures 1.25 mile away as shown in the cumulative effect simulation. Alternatives COUT-C (including route variations), COUT-H, and COUT-I would have lower additive cumulative effects on views from the visitor center since the Project would be screened partially by the previously mentioned ridge. To reduce cumulative effects on views from the location, the two proposed transmission projects could be colocated south of the ridge to minimize their level of dominance on views from the Dinosaur National Monument.

Key Observation Point Number 217 – Skyline Drive Scenic Backway

From this viewpoint along the Skyline Drive Scenic Backway, views are modified minimally by existing development compared to the area approximately 0.75 mile south of this location where an existing transmission line crosses the scenic road. Due to topographic screening, the existing transmission line has a localized effect on the scenic drive and based on the relative scale and construction materials (wood), the existing transmission line does not dominate these views. Similar to the description for Indian Creek Campground, the BLM Richfield Field Office has oil and gas leases in the area and if developed, would introduce additional structures inconsistent with the existing landscape character. Through the addition of the Project (Alternative COUT-I) and the TransWest Express Transmission Project, the area north of the existing transmission line would become dominated by transmission lines including their associated construction access roads and right-of-way vegetation clearing. By expanding the area influenced by these utility projects, views may become industrialized along this portion of the Skyline Drive Scenic Backway. To reduce the cumulative effect on these views, the two transmission projects could be colocated with the existing transmission line in Dry Pole Fork Canyon to limit the visibility of transmission lines projects

from this scenic road. Please note based on the current alignment for the TransWest Express Transmission Project, which crosses the Project multiple times in this area, the TransWest Express Transmission Project was relocated 1,500 feet south of the existing transmission line and therefore would not be visible from this viewpoint.

Key Observation Point Number 260 – Energy Loop Scenic Byway (UT SR 31) (simulation)

Motorists driving the Utah State Route 31 portion of the Energy Loop Scenic Byway would view areas along Cottonwood Creek that have been influenced minimally by development. Through the addition of the Project (Alternative COUT-H) and the TransWest Express Transmission Project, views would begin to become dominated by transmission line facilities including transmission line structures, associated access roads, and right-of-way vegetation clearing as shown in the cumulative effect simulation. Since the TransWest Express Transmission Project parallels the scenic byway for approximately 2.5 miles, whereas the Project crosses the road and is located approximately 0.5 mile away from the road where views toward the Project would be screened partially, potential mitigation would include colocation of the two projects north of the scenic byway to reduce the cumulative effect on these views.

Key Observation Point Number 261 – Fairview Residential (simulation)

Views from residences in the community of Fairview have been modified where existing development is located between the viewer and the Wasatch Plateau (as shown in the visual simulation). Other than the existing development in and around Fairview, the character of the Wasatch Plateau, as viewed from Fairview, has been modified minimally by development. Through the introduction of the Project (Alternative COUT-H) and the TransWest Express Transmission Project, views from Fairview would be influenced by the associated transmission line structures, right-of-way vegetation clearing, and access roads as shown in the cumulative effect simulation. Due to the distance between the viewpoint and these projects, approximately 2 miles, these two projects would not dominate views from Fairview.

Key Observation Point Number 262 – Mount Pleasant Dispersed Residences (simulation)

The area of dispersed residences east of Mount Pleasant have views which have been modified by the existing transmission line that traverses the Wasatch Plateau through the presence of transmission lines structures and right-of-way vegetation clearing. Due to the relative scale and construction materials (wood) of the existing transmission line, it does not dominate views from these residences. Through the introduction of the Project (Alternative COUT-I) and the TransWest Express Transmission Project into this area, which have design characteristics in common with the existing transmission line, views would become dominated by three transmission lines, which would locate many residences between each subsequent transmission line as shown in the cumulative effect simulation. In other words, residences would have views of transmission lines looking both to the northeast and southwest, creating a type of tunnel-effect. As such, potential mitigation would be to colocate the two proposed transmission lines with the existing transmission line to the extent practicable reducing cumulative effects on views from these residences.

Key Observation Point Number 265 – Interstate 15 (Nephi) (simulation)

Motorists driving I-15 near Nephi have views that have been modified by existing development including several transmission lines, development in and around Nephi, and the interstate highway itself. These existing modifications begin to dominate views, especially north of Nephi, producing a landscape character viewed as industrial in nature. Through the introduction of the Project (all alternative routes in this route grouping) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission lines, views from I-15 north of Nephi would be dominated by transmission lines including several skylined transmission structures which further dominate views due to

their visibility on ridges as shown in the cumulative effect simulation. To minimize cumulative effects on these views, the two proposed transmission projects could be colocated with the existing transmission lines and use topographic screening opportunities to the extent practicable.

Key Observation Point Number 266 – U.S. Highway 6 (Spanish Fork Canyon) (simulation)

Motorists on this portion of U.S. Highway 6 have views that are influenced, and in some locations dominated, by existing development including several transmission lines. The introduction of the Project (Alternatives COUT-A, COUT-B, and COUT-C including all route variations) and the TransWest Express Transmission Project would, in addition to the existing transmission lines which have similar design characteristics as the Project, dominate views along this portion of U.S. Highway 6 as shown in the cumulative effect simulation. This level of dominance is a result of skylined transmission lines, right-of-way vegetation clearing in overstory vegetation, and the construction of access roads in steep terrain. To reduce cumulative effects on these views, potential mitigation would include colocation of the two proposed transmission projects with the existing transmission line and minimizing additional skylined transmission structures to the extent practicable.

Key Observation Point Number 269 – Fruitland Residential

Views from residences in Fruitland have been influenced, and locally dominated, by the existing transmission line. Residences located adjacent to the transmission line have views dominated by transmission structures whereas residences located further away have less dominated views. These views have also been modified by U.S. Highway 40, as well as dispersed residences and associated agricultural lands, which create a rural character. Through development of areas leased for oil and gas wells, views may also become influenced by oil and gas development including structures and associated access roads. The addition of the Project (Alternative COUT-A and route variation) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, would further extend the area dominated by transmission lines. The Project is colocated with the existing transmission line which would not considerably extend the area viewed as a transmission line corridor. The TransWest Express Transmission Project alternative route (not visible in the simulation) is located more than 1 mile from the existing transmission line which would extend the visual influence of transmission lines to larger number of residences in and around Fruitland. To minimize these cumulative effects, the two proposed transmission lines should be colocated with the existing transmission line to the extent practicable.

Key Observation Point Number 272 – Sand Wash North Destination Route (simulation)

Recreationists on this portion of Sand Wash Road, traveling to the Sand Wash put-in on the Green River, have views that have been minimally influenced by existing development when compared to the more extensive oil and gas dominated landscapes this road passes through to the north. Areas leased, but not yet developed, for oil and gas wells would introduce industrial facilities into a natural appearing landscape and would modify these views. Through the addition of the Project (Alternatives COUT-C [and route variations], COUT-H, and COUT-I) and the TransWest Express Transmission Project, these views would become dominated by energy-related infrastructure including a variety of different structures types and a network of access roads as shown in the cumulative effect simulation. To reduce cumulative effects on these views, potential mitigation would be to colocate the two proposed transmission lines to the extent practicable to minimize the additional effect of these projects, in context with expanding oil and gas fields, on views from this recreation destination route.

Key Observation Point Number 274 – Indian Canyon Scenic Byway (U.S. Highway 191) (simulation)

Motorists on this portion of the Indian Canyon Scenic Byway have views influenced by an existing transmission line but due to the scale of the existing transmission line and construction materials (wood); this feature does not dominate views from the scenic road. Existing oil and gas wells are located on the flat plateau lands above the canyon and as such, are not visible in this portion of the scenic byway. The addition of the Project (Alternative COUT-H) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, would produce views dominated by transmission lines including a series of transmission structures paralleling the road, additional right-of-way vegetation clearing, and construction access roads as shown in the cumulative effect simulation. Due to the steep, forested slopes, the two proposed transmission projects should be colocated with the existing transmission line to the extent practicable to minimize cumulative effects through the expansion of the area viewed as a transmission line corridor.

Key Observation Point Number 284 – Energy Loop Scenic Byway (UT SR 264) (simulation)

Motorists driving the Utah State Route 264 portion of the Energy Loop Scenic Byway have views minimally modified by development except for the cluster of summer homes located to the south. Through the introduction of the Project (Alternative COUT-H) and the TransWest Express Transmission Project, views along this portion of the Energy Loop Scenic Byway would begin to become dominated by transmission line structures and potentially through right-of-way vegetation clearing as shown in the cumulative effect simulation. To minimize the cumulative effects on these views of a geometric cleared right-of-way, potential mitigation would include colocation of the two transmission projects east of the aspen groves, visible in the simulation, to the extent practicable. It is important to note that a future reservoir is planned to be located in this area, the Narrows Reservoir, which would require the scenic byway to be relocated to the north. The future reservoir itself may increase landscape variety and be seen as a positive cumulative effect but based on the final alignment for the highway, this realignment may cause additional cumulative effects on views from the scenic byway as a result of longer duration views of the previously mentioned transmission line projects including the Project.

Key Observation Point Number 285 – Aspen Grove Campground (simulation)

Views from the Aspen Grove Campground have been minimally influenced by development except for recreation based development including the adjacent marina, campground, and summer homes. The existing transmission line is screened from view in this area by topography and as such, does not influence views from this campground. Due to constraints resulting from the location of the existing transmission line and separation between the Project (Alternative COUT-A and route variation) and the TransWest Express Transmission Project, these transmission lines would be visible from the campground and would modify the associated views through the introduction of skylined transmission structures, right-of-way vegetation clearing, and potentially the construction of access roads as shown in the cumulative effect simulation. To minimize these cumulative effects on views, potential mitigation would be to colocate to two proposed transmission lines with the existing transmission line to the extent practicable to reduce the visibility of these features. In addition, a proposed residential development is planned to be located on the ridge which may modify views from the campground if residences are skylined on the ridge.

Key Observation Point Number 304 – Sheep Creek Road (Forest Road 042) (simulation)

Motorists driving Forest Road 042 in the Uinta-Wasatch-Cache National Forest have views influenced but not dominated by existing development including an existing transmission line which traverses the ridge and introduces a skylined transmission structure and geometric right-of-way vegetation clearing.

The addition of the Project (Alternative COUT-A and route variation) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, would further modify these views and dominate views from this overlook through a series of skylined structures on the ridge and cleared right-of-ways as shown in the cumulative effect simulation. Alternative COUT-A would introduce additional cumulative effects, when compared to the route variation, since the Project would cross the existing transmission line and the TransWest Express Transmission Project in view of this overlook. This crossing may require taller structures and would benefit from micro siting of structures to minimize cumulative effects on these views. To further reduce cumulative effects, the two transmission projects should be colocated with the existing transmission line to the extent practicable which would decrease the area viewed as a transmission line corridor.

Key Observation Point Number 309 – Bear Creek Campground

Views from this campground have been modified by several transmission lines, the Huntington Power Plant, and existing and leased oil and gas development. It is important to note that due to the enclosed views from in the southern portion of the campground, where the simulation was developed, these existing modifications are not visible whereas views at the entrance of the campground are dominated by these existing features. Through the introduction of the Project (Alternative COUT-I) and the TransWest Express Transmission Project, views would be minimally affected where the existing industrial modifications are visible but where enclosed views in the campground would only view the two proposed transmission projects in steep terrain approximately 2 miles away, these views would be influenced by energy-related development. In particular, repeating transmission lines structures, right-of-way vegetation clearing, and construction access roads would be visible near the ridgeline in the simulation. Due to the overlap of the proposed alignments for the Project and the TransWest Express Transmission Project, the TransWest Express Transmission Project was relocated 1,500 feet south of the Project and, therefore, would not be visible from this viewpoint.

Key Observation Point Number 325 – Argyle Canyon Residences

Views from residences and summer homes in this portion of Argyle Canyon have been influenced by an existing transmission line but due to its scale and materials (wood), as well as through vegetation screening, it does not dominate these views. The addition of the Project (Alternative COUT-B and route variations) and the TransWest Express Transmission Project would produce views beginning to be dominated by transmission lines including taller, steel structures which may rise above the trees screening the existing transmission line and introduce additional areas of vegetation clearing into these views. To minimize cumulative effects on views from these residences, potential mitigation would be to colocate the two proposed transmission lines with the existing transmission line where existing topography and vegetation can be used to partially, or if possible, completely screen views of these projects. Note that no cumulative effect simulation was prepared since the current alignments for the Project and the TransWest Express Transmission Project overlap and based on the proposed 1,500-foot separation between the projects; the TransWest Express Transmission Project would be located further to the south and would be screened by topography.

Key Observation Point Number 330 – Indian Canyon Scenic Byway

Motorists on this portion of the Indian Canyon Scenic Byway have views influenced by scattered recreation cabins and to the northeast of this viewpoint, an existing communication facility on Argyle Ridge, which does not dominate views along the scenic byway. Through the addition of the Project (Route Variations COUT-B-1 and COUT-C-1) and the TransWest Express Transmission Project, these views would begin to become dominated by utility development along this portion of the scenic road. These projects would include the introduction of skylined transmission structures, right-of-way vegetation clearing, and associated access roads, which are inconsistent with the existing landscape character viewed

from this location. To reduce the cumulative effect on these views, the two transmission projects could be colocated to the extent practicable in addition to limiting vegetation clearing in the projects' rights-of-way and using existing screening opportunities through tower micro-siting.

4.3.17 National Trails System

The approach for analyzing cumulative effects on National Scenic and Historic Trails (including trails undergoing feasibility study) was based on direction provided in BLM Manual 6280 and through coordination with BLM National Trails' staff. Cumulative effects on National Trails would result from the incremental effects on trail-associated resources as well as future management of the trail through development of past, present, and RFFAs.

The geographic scope for analyzing cumulative effects on NSTs was identified as the extent of the trail alignment located in the BLM Field Offices traversed by the Project. For NHTs, the geographic scope was defined by the high potential route segments and high potential historic sites, or feasibility study alignments for trails under study, identified in the areas located adjacent to the Project. The temporal scope for analysis of cumulative effects on both NSTs and NHTs (including trails under feasibility study) was defined by the length of the agency right-of-way grant for the Project (50 years), but it is important to note that potential future right-of-way grant extensions may extend the life of the Project beyond 50 years. The cumulative effect analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.17) and considers them in context with the past, present, and RFFAs listed in Tables 4-1 and 4-2.

4.3.17.1 Issues Identified for Analysis

4.3.17.1.1 Effects on Trail's Resources, Qualities, Values, Associated Settings, or Primary Use(s)

Cumulative effects on a NST or NHT (including trails under feasibility study) may result from the development of past, present and RFFAs through the modification of the trail's resources, qualities, values, associated settings, or primary use(s). This analysis was completed in a manner consistent with the direct and indirect impact methodology described in Chapter 3 of this document. In general, those areas where transmission line projects would be colocated such that they are consolidated physically, as well as visually, effects would be reduced. Matching spans to the extent practicable and sharing construction and maintenance access roads would further reduce cumulative effects of such projects. In locations where projects would deviate from using the same corridor, cumulative effects generally increase as the trail's resource and settings become more fragmented and in regard to scenic resources specifically, the industrial nature of transmission line projects would have a stronger effect on the trail setting. In addition, if the past, present, and future projects are visually similar (i.e., transmission lines seen in context with other transmission lines); the dominance of the aggregate of projects is reduced. Inversely, if the aggregate of the projects are incongruent (i.e., a mixture of natural gas wells, with transmission lines, and other modifications), cumulative effects are greater. The following summarizes the resource values analyzed to determine cumulative effects on National Trails.

Scenic Resources

- Cumulative effects resulting in the incremental modification to the integrity of the associated settings and scenic values for which the National Trail was designated
- Cumulative effects on the naturally appearing landscapes associated with National Trails, regardless of scenic quality rating

Historic and Cultural Resources

- Cumulative effects on historic/cultural resources would include the loss of cultural artifacts, features, or sites that could have cultural significance or could yield important information about the National Trail
- Cumulative impacts on the trail's setting and those characteristics that support the trail setting

Recreation (including travel management)

- Cumulative effects on high-quality recreation opportunities; relative freedom from intrusion; opportunities for vicarious experiences; and conservation, protection, and restoration of National Trail resources, qualities, values, and associated settings
- Cumulative effects on desired recreation setting characteristics
- Cumulative effects on the primary use or uses of the National Trail
- Cumulative effects on the travel systems in the area, including permanent access that could generate more movement in areas that would not have previously been accessible

Natural Resources and Other Landscape Elements

- Cumulative effects on natural resources (biological, geological, and scientific) relate to ground disturbance and the resulting loss of biological, geological, or other scientific resources
- Cumulative effects on the natural settings that are the geographic extent of the natural landscape elements that influence the trail experience and contribute to resource protection

4.3.17.2 Existing Condition

4.3.17.2.1 Continental Divide National Scenic Trail

The alignment for the Continental Divide NST was modified based on analysis completed for the Sierra Madre-Chokecherry Wind Farm Project which would have dominated the setting and experience of the scenic trail along its former alignment adjacent to Wyoming Highway 71. Based on these potential effects, the Continental Divide NST was relocated further to the west between Atlantic Rim and Coal Mine Ridge into an area with fewer existing cultural modifications. Due to the topographic screening afforded by these two ridges, views of the wind farm to the east and areas leased for oil and gas development to the west would be mostly screened from hikers using the new trail centerline. In the location where the trail descends into Eightmile Lake Basin, adjacent to other recreation opportunities, the setting would be modified through the construction and operation of the Sierra Madre-Chokecherry Wind Farm.

4.3.17.2.2 Old Spanish National Historic Trail

Adjacent to the congressionally designated alignment and trail traces for the Old Spanish NHT, development has modified the experience of the historic trail but these features do not dominate the setting. In particular for the Book Cliffs Analysis Unit, existing development is associated with I-70, several pipelines paralleling I-70, areas leased for oil and gas development by the State of Utah and the Moab Field Office, and intermittent industrial development. Further to the west, in the San Rafael Swell Analysis Unit of the Old Spanish NHT, there are fewer existing modifications than the Book Cliffs Analysis Unit. An existing transmission line has modified the character of adjacent areas but due to the smaller scale and construction materials (wood), the existing transmission line does not dominate the setting for the trail in the San Rafael Swell, though the natural integrity of portions of the trail have been compromised.. The State of Utah has leased areas for oil and gas development in the state-administered parcels adjacent to the Old Spanish NHT, which if developed, would further modify the trail's setting.

4.3.17.2.3 Overland Historic Trail

As described in Chapter 3, there are two alignments for the Overland Historic Trail under feasibility study that diverge south of Rawlins: (1) the northern option turns north and parallels Wyoming Highway 71 toward Rawlins and (2) the southern option continues to the west toward Fort LaCleve. The northern option is located adjacent to Wyoming Highway 71 where existing development has influenced the area, which will be further modified by the construction and operation of the Sierra Madre-Chokecherry Wind Farm. The southern option traverses an area heavily influenced by oil and gas development, as well as associated pipelines, which begin to dominate the trail's existing setting.

4.3.17.2.4 Cherokee Historic Trail

Similar to the Overland Historic Trail, two alignments are under feasibility study by the NPS: (1) the 1849 route which parallels Wyoming Highway 71 toward Rawlins and (2) 1850 route which crosses Wyoming Highway 789 13 miles north of Baggs then crosses Flat Top Mountain before paralleling the Wyoming-Colorado border. Similar to the northern option of the Overland Historic Trail, the 1849 route would be located adjacent to existing development that has modified the trail's setting, which on the construction and operation of the Sierra Madre-Chokecherry Wind Farm; the trail's setting would be further modified. The 1850 route first traverses an area modified by oil and gas development adjacent to Wyoming Highway 789 before ascending Flat Top Mountain. The area from Flat Top Mountain to Powder Rim, adjacent to the Wyoming-Colorado border, has few existing modifications except for a series of pipelines crossing Powder Rim into Cherokee Basin. These existing modifications influence, but do not dominate, the setting for the Cherokee Historic Trail though the local integrity of the setting has been compromised.

4.3.17.3 Results

4.3.17.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Continental Divide National Scenic Trail

The area associated with the Continental Divide NST, potentially traversed by the Project, has limited existing development. To the north, the city of Rawlins and adjacent development has modified the resource values for this scenic trail. South of the Project area in the Rawlins Field Office, the trail's values would be modified through the introduction of the Sierra Madre-Chokecherry Wind Farm directly adjacent to the trail alignment. Future development including all alternative routes and route variations for the Project, in addition to the Gateway West and TransWest Express transmission projects, would introduce transmission line structures adjacent to the trail in the enclosed landscape associated with Coal Mine Draw, where there are few visible intrusions. The right-of-way vegetation clearing associated with these proposed projects could result in geometric forms along the ground plane, as well as impact shrubland riparian habitat and related values along Coal Mine Draw. However, if the proposed transmission lines were constructed using shared access, similar color treatments (all dulled grey steel) and spans between towers where matched, cumulative effects could be reduced. In addition to these transmission line projects, a proposed wind farm (Hogback Ridge) would be located adjacent to the Continental Divide NST which could alter the distinctive Atlantic Rim setting and its associated natural features as well as dominate views from recreation areas in Eightmile Lake Basin (including Rim Lake Recreation Area). Motorists on Wyoming Highway 71, an access route for the Continental Divide NST and located in the Continental Divide NST SRMA, would experience views dominated by wind farms associated with the proposed wind farm and the Sierra Madre-Chokecherry Wind Farm being located on either side of the road. Even though no trail-associated cultural properties were identified as part of this study, the development of past, present, and future projects may affect future potential interpretation of cultural properties through degradation of the trail's setting.

Overland Historic Trail

Existing development in proximity to the northern option of the Overland Historic Trail (under feasibility study), adjacent to the Project, includes the Sierra Madre-Chokecherry Wind Farm, which will dominate views from the trail paralleling Wyoming Highway 71. Through development of the proposed Hogback Ridge Wind Farm and other future actions, including all Project alternative routes, this area would be increasingly influenced by energy infrastructure which would degrade the trail's setting and dominate views from identified recreation areas. The inventory of cultural properties in this area has not yielded any trail-associated sites but through development of past, present, and future projects, the future discovery of important trail-associated cultural sites could be affected.

Oil and gas development, as well as associated pipelines, have modified the areas adjacent to the southern option of the Overland Historic Trail, and all alternative routes in this route grouping, through the introduction of industrial structures, a network of access roads, and vegetation clearing. These modifications are also visible from trail-associated cultural sites including the Dug Springs Stage Station Ruins, Barrel Springs, Signature Rock, Duck Lake Stage Station (intense adjacent existing development), and the Washakie Station (limited adjacent development) as well as trail-associated access routes (Wamsutter Road, Eureka Headquarters Road, and Duck Lake Road). The development of future actions including the Project, the TransWest Express Transmission Project, and the expansive Continental Divide-Creston Junction oil and gas field, the areas adjacent to the Overland Historic Trail in this portion of the BLM Rawlins Field Office have the potential to be dominated by industrial development. Views from the Overland Trail Ruts Interpretive Site, along Alternative WYCO-D (and route variation) have been influenced by past projects, which may result in an industrialized landscape setting if these future projects were constructed. The development of these areas also has the potential to modify the narrow shrubland riparian zones through vegetation clearing associated with these projects, in particular on Alternative WYCO-C and its route variations and Alternative WYCO-D (and route variation) along Barrel Springs Draw and Muddy Creek respectively. However, if the proposed transmission lines were constructed using shared access, had similar color treatments (all dulled grey steel) and spans between towers where matched, cumulative effects could be reduced.

Cherokee Historic Trail

Cumulative effects on the 1849 route for the Cherokee Historic Trail (under feasibility study) are similar to the cumulative effects on the northern option of the Overland Historic Trail as these trails are located in proximity to each other.

The areas associated with the 1850 route for the Cherokee Historic Trail, adjacent to Alternative WYCO-D (and route variation) along Wyoming Highway 789 and the first trail crossing on Alternative WYCO-F and its route variations located 2.5 miles west of Wyoming Highway 789, have been influenced by existing oil and gas development. Through the introduction of the Project along these alternatives routes, the TransWest Express Transmission Project, and the development of the Continental Divide-Creston Junction oil and gas field, the area adjacent to the Cherokee Historic Trail has the potential to become visually compromised by industrial facilities, and would yield a landscape that has decreased scenic integrity. The area farther to the west, where Alternatives WYCO-B and WYCO-C and their route variations cross the Cherokee Historic Trail and Shell Creek Stock Trail (a trail-associated access road), has been influenced by an existing pipeline corridor which include strong geometric vegetative patterns resulting from right-of-way vegetation clearing. These pipelines influence, but do not entirely define the trail's setting nor, dominate views from this area. Based on the potential development of the Project and the TransWest Express Transmission Project, the setting would likely exhibit an industrial character defined by tall, formal, and geometric lattice transmission structures. It is important to note that Alternative WYCO-B and its route variations would parallel the Cherokee Historic Trail from 1 to 4 miles away for a distance of approximately 15 miles. A portion of this would occur adjacent to Hangout Road

which provides access to the historic trail, in an area minimally modified by development except for an area of oil and gas wells on Flat Top Mountain.

Since there is limited future development planned for this area, the introduction of the Project and the TransWest Express Transmission Project would modify and may begin to dominate views from portions of the trail located closest to these projects north of Hartt Cabin Draw. South of this area, views from McPherson Springs (a trail-associated cultural site) may become dominated by the introduction of the Project (Alternative WYCO-B) and the TransWest Express Transmission Project in addition to the existing oil and gas facility adjacent to the springs. To reduce cumulative effects on this site's trail-related setting, potential mitigation would be to locate both the Project and the TransWest Express Transmission Project further to the west to increase opportunities to screen views of these projects. The two other trail crossings associated with Alternative WYCO-F (at Sand Creek and Colloid Draw), as well as being located in proximity to Shell Creek Stock Trail and Sand Creek Road (trail access routes), would occur in areas with limited existing and planned future development. As such, the introduction of the Project and the TransWest Express Transmission Project has the potential to begin to dominate views at these trail crossings through the construction of tall, transmission structures incongruent with the existing landscape character. However, if the proposed transmission lines were constructed using shared access, had similar color treatments (all dulled grey steel) and spans between towers were matched, cumulative effects could be reduced.

In all areas located in proximity to the Cherokee Historic Trail, there is a potential cumulative effect on historic resources through the development of past, present, and future projects which may result in the loss of cultural artifacts, features, or sites that could yield important information about the trail.

4.3.17.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) **Old Spanish National Historic Trail**

There are two analysis areas for the Old Spanish NHT identified by the BLM, as described in Chapter 3, with all three alternative routes in this route grouping sharing the same alignment in proximity to the Book Cliffs Analysis Unit. This area has been modified by I-70, pipelines adjacent to I-70, areas leased for oil and gas development, and intermittent industrial development which influences but does not compromise the setting for the Old Spanish NHT. Recreation-based views of the Old Spanish NHT setting occur along I-70 (partially designated as the Dinosaur Diamond Scenic Byway) and the associated rest areas/scenic overlooks including the Harley Dome Rest Area and Overlook, Thompson Welcome Center, and Crescent Junction Rest Area. East of Green River along NHT II and III trail traces, areas permitted for oil and gas development by the Moab Field Office have the potential to further influence the setting and views associated with the Old Spanish NHT through the introduction of industrial structures and a network of access roads. The further introduction of the Project and the TransWest Express Transmission Project into these areas would produce a landscape which may be viewed as industrial in nature. To reduce cumulative effects on the Old Spanish NHT along this analysis unit, potential mitigation would include colocation of the two proposed transmission projects to the extent practicable. This would not only reduce impacts on the setting and views associated with the Old Spanish NHT but also would minimize effects on riparian vegetation corridors south of the Book Cliffs, through reduced right-of-way vegetation clearing, and potential cultural resources that could be effected through a larger area of cumulative disturbance.

In the San Rafael Swell Analysis Unit, there are limited existing modifications except for a lower voltage transmission line paralleled by Alternative COUT BAX-B adjacent to a series of NHT II and III trail traces along Cottonwood Wash, a trail-related prehistoric and historic rock art site in Big Hole Wash as identified by the BLM's NHT Inventory Project, and the Big Hole ACEC. Based on the potential development of areas leased for oil and gas wells by the State of Utah, this area has the potential to

become more influenced by energy infrastructure. The introduction of the Project would further modify and dominate the trail setting and views from trail-associated resources in this area. There is also the potential for disturbance of riparian vegetation along Cottonwood Wash where the right-of-way would be cleared of vegetation.

The same existing transmission line is located adjacent to Alternatives COUT BAX-B and COUT BAX-C through Buckhorn Flat in an area of NHT II and III trail traces adjacent to the Wedge Overlook/Buckhorn Draw Scenic Backway and the newly constructed recreation kiosk at the turnoff to the Wedge Overlook. The existing transmission line does have an effect on the setting for the Old Spanish NHT in this area but due to the scale of the structures and construction materials (wood), it is relatively benign in the setting. Through introduction of the Project and the TransWest Express Transmission Project, this setting would be locally modified from the presence of large scale lattice transmission structures (towers) and right-of-way vegetation clearing in evenly occurring pinyon-juniper woodland communities. The visibility of the right-of-way vegetation clearing would be most apparent from the Cedar Mountain Overlook which has superior views over Buckhorn Flat. In addition to these proposed projects, development of the proposed Emery County wind farm would further effect the setting for the Old Spanish NHT in Buckhorn Flat by introducing a series of skylined structures on Cedar Mountain, which through their motion and shade and shadow patterns, would attract views from adjacent recreation areas.

The setting along U.S. Highway 6 (designated as the Dinosaur Diamond Scenic Byway), adjacent to Alternatives COUT BAX-C and COUT BAX-E, has been altered by a lower voltage transmission line and railroad line. These features do have an influence on the setting but do not dominate views along this designated scenic travel route adjacent to the congressionally designated alignment of the Old Spanish NHT. Development of the Project, the TransWest Express Transmission Project, and the Twin Bridges Oil and Gas Field would result in the local setting viewed as being primarily for energy usage. The local setting would then exhibit a strong industrial character for this segment of the Old Spanish NHT. To reduce cumulative effects on views from U.S. Highway 6 and the trail setting, potential mitigation would include colocation of the two proposed transmission lines as close to the Book Cliffs landscape as practicable. By locating these projects closer to the Book Cliffs, the geometric lines and complex shade and shadow patterns associated with dull grey steel lattice would readily be absorbed by the horizontal lines and banding color of the landforms. It is important to note that no trail traces were identified in this area through the BLM's NHT Inventory Project. Similarly, Alternative COUT BAX-C would parallel the Green River Cutoff Road in an area with limited existing modifications. The Green River Cutoff Road provides access into the San Rafael Swell, may be viewed as associated with the Old Spanish NHT due to its proximity to the congressionally designated alignment of the trail. Through the addition of the Project, the TransWest Express Transmission Project, and Twin Bridges oil and gas field, views of this area would become dominated by industrial development including energy-related structures, a network of access roads, and geometric clearing of pinyon-juniper vegetation. To minimize cumulative effects on these views, the two proposed transmission projects could be colocated further to the north where existing terrain would begin to screen views of the projects from the Green River Cutoff Road. If the transmission lines were constructed using shared access, had similar color treatments (all dulled grey steel) and spans between towers where matched, cumulative effects could be reduced further.

4.3.17.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Since no designated National Historic Trail, National Scenic Trail, or trails undergoing a feasibility study for inclusion with the National Trails System are adjacent to the alternative routes in the COUT route group (including route variations), this section is not pertinent for analysis of the Project.

4.3.18 Cultural Resources

Over time, cultural resources are subject to attrition as cultures change and archaeological and historical sites weather and erode. In addition, prior development in the region has either degraded or resulted in the loss of some cultural resources. The addition of the Project to past, present, and RFFAs would result in the greater potential for effects on cultural resources throughout the Project area.

The geographic scope of analysis for cultural resources is defined as a 4-mile-wide corridor centered on the reference centerlines (similar to the methodology identified in Section 3.2.18). Cumulative effects on cultural resources would occur over the life of the Project and other current and future projects, including direct effects during construction and indirect effects during operation and maintenance activities. Disturbances from future developments and ground-disturbing activities could uncover or destroy unrecorded cultural resource sites. Despite the potential for adverse effects on some sites, future actions proposed on federal and/or state lands would require cultural resource evaluations and mitigation of affected significant historic properties prior to implementation. The resulting cultural resource documentation would increase the cultural resources knowledge base for the overall region; however, developments solely on private land are largely exempt from this requirement. Cumulative effects would be analyzed over the duration of the life of the Project.

The approach for analysis of cumulative effects on cultural resources, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.18) and considers them in conjunction with the past, present, and RFFAs listed in Tables 4-1 and 4-2.

4.3.18.1 Issues Identified for Analysis

Other present and reasonably foreseeable future projects that could have cumulative effects on cultural resources along the proposed alternative routes for the Project (Tables 4-1 and 4-2) include, but are not limited to, the PacifiCorp Seven Mile Hill Wind-Energy Facility (Wyoming), the Continental Divide-Creston Natural Gas Project (Wyoming), the Blue Mountain Energy Deserado Mine Project (Colorado), the Uinta Natural Gas Development Project (Utah), the TransWest Express Transmission Project (multi-state), the Hiawatha Regional Energy Development Project (multi-state), the Newfield Exploration Company Monument Butte Area Oil and Gas Development Project (Utah), the Victory Pipeline Project (Utah) and the Bill Barrett Corporation Blacktail Ridge Project (Utah). The majority of present and future actions that could have cumulative effects on cultural resources are associated with oil and gas development, mining/mineral exploration, transportation, utility corridors, renewable energy (e.g., wind and solar) development, and parks and recreation.

Cumulative effects from direct impacts associated with the construction and operation phases of the Project would be similar for any of the alternative routes. Cultural resources could be destroyed by construction activities, such as clearing, grading, drilling, and substation development. Development of new access corridors and rights-of-way could increase access to previously inaccessible areas, leading to potential vandalism of cultural resource sites, including both those previously recorded and those which are yet to be encountered. There also could be cumulative effects from indirect impacts in the form of visual impacts on visually sensitive cultural resource sites. Development would introduce visual, atmospheric, and audible elements that could detract from the cultural significance of designated or potential TCPs and adversely impact cultural resource sites that are eligible, or have been listed in the NRHP. The introduction of additional development could alter the setting and feeling of numerous NRHP eligible archaeological sites (e.g., habitation structures, ceremonial sites, and rock art), as well as significant historic properties, such as the Old Spanish NHT, the Cherokee Historic Trail, the Overland Historic Trail, the Dragon to Rangely Stage/Freight Road, U.S. Highway 6, the Rawlins to Baggs Stage

Road, the Lincoln Highway, the old Victory Highway, the Buckhorn Flat Railroad, the Uintah Railway, and the D&RGW Railway.

Other cultural resources that would be affected cumulatively by implementation of the Project alternative routes, in combination with present and RFFAs, include 33 NRHP-listed properties (including Red Rock Site, Hanna Community Hall, Canyon Pintado NHD, Carrot Men Pictograph Site, Buckhorn Wash Rock Art Sites, and the D&RG Lime Kiln [Buckhorn Flat Lime Kiln]), 6 ACECs with cultural resources (Big Hole, Cottonwood Canyon, Grassy Trail, Smith Cabin, Tidwell Draw, and Nine Mile Canyon), Argyle Canyon Rock Art (Archaeological Sites), and a designated TCP (Ute vision quest site [42UT395])

The extent of cumulative effects on cultural resources could be reduced significantly through avoidance and the implementation of selective mitigation measures. Potential impacts on cultural resources in the area would be incremental and the potential to mitigate impacts on archaeological and historical sites is good. The indirect cumulative effects on cultural resources, as a result of increased public access, would be expected to be low.

4.3.18.2 Results

Cumulative effects from direct impacts associated with the construction and operation phase of the Project would be similar for any of the alternative routes. Cultural resources could be destroyed by construction activities, such as clearing, grading, drilling, and substation development. Development of new access corridors and rights-of-way could increase access to previously inaccessible areas, leading to potential vandalism of cultural resource sites. There also could be cumulative effects from indirect impacts in the form of visual impacts on visually sensitive cultural resource sites. Development would introduce visual, atmospheric, and audible elements that could detract from the cultural significance of designated or potential TCPs and adversely impact cultural resource sites that are eligible, or have been listed in the NRHP.

4.3.18.2.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

The introduction of additional development could alter the setting and feeling of numerous NRHP eligible archaeological sites, as well as significant historic properties located along the WYCO alternative routes (including route variations). Significant cultural resources include, but are not limited to, the Cherokee and Overland historic trails (contributing and non-contributing segments), the Rawlins to Baggs Stage Road, the Lincoln Highway, and two NRHP-listed properties (Red Rock Site and Hanna Community Hall) in Wyoming; and the old Victory Highway in Colorado.

As a result of the presence of existing development projects and proposed future actions, including, but not limited to the TransWest Express Transmission Project, numerous known cultural resources and potentially significant cultural resources could be negatively affected throughout this portion of the Project area. If colocated, the TransWest Express Transmission Project could have a negative impact on many of the same cultural resources that would be affected by the Project.

Overall, the addition of the Project to past and RFFAs would result in a greater potential for cumulative effects on numerous known culturally significant resources and other potentially significant cultural resources or historic properties that could be considered NRHP eligible, or could be determined as eligible for listing in the NRHP.

The extent of cumulative effects on cultural resources could be reduced significantly through avoidance and the implementation of selective mitigation measures. Potential impacts on cultural resources in this area would be incremental and the potential to mitigate impacts on archaeological and historical sites is

good. The indirect cumulative effects on cultural resources, as a result of increased public access, would be expected to be low.

4.3.18.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

The introduction of additional development could alter the setting and feeling of numerous NRHP eligible archaeological sites, as well as significant historic properties located along all of the COUT BAX alternative routes, such as the Dragon to Rangely Stage/Freight Road, the Dragon-Douglas Trail, U.S. Highway 6, the Uintah Railway, and two NRHP-listed properties (Canyon Pintado NHD and Carrot Men Pictograph Site) in Colorado; the Old Spanish NHT (recorded and unrecorded segments) and U.S. Highway 6 (recorded and unrecorded segments) in Colorado and Utah; and the Buckhorn Flat Railroad, the D&RGW Railway, 25 NRHP-listed historic properties, and 5 ACECs with cultural resources (Big Hole, Cottonwood Canyon, Grassy Trail, Smith Cabin, and Tidwell Draw) in Utah. NRHP-listed historic properties, as described in the cultural resources inventory summary in Chapter 3 (Section 3.2.18.5.2), include 14 historic buildings (residential), 1 historic farmstead, the Juab County Jail, Wasatch Academy, Mount Pleasant Carnegie Library, Fountain Green Hydroelectric Plant Historic District, Nephi Main Post Office, Mount Pleasant High School Mechanical Arts Building, Mount Pleasant Commercial Historic District, Mount Pleasant National Guard Armory, the D&RG Lime Kiln (Buckhorn Flat Lime Kiln), and the Buckhorn Wash Rock Art Sites.

As a result of the presence of existing development projects and proposed future actions, including, but not limited to the TransWest Express Transmission Project, numerous known cultural resources and potentially significant cultural resources could be negatively affected throughout this portion of the Project area. If colocated, the TransWest Express Transmission Project could have a negative impact on many of the same cultural resources that would be affected by the Project.

Overall, the addition of the Project to past and RFFAs would result in a greater potential for cumulative effects on numerous known culturally significant resources and other potentially significant cultural resources or historic properties that could be considered NRHP eligible, or could be determined as eligible for listing in the NRHP. For areas adjacent to the Book Cliffs (east of Alternatives COUT BAX-C and COUT BAX-E), there is a high potential for encountering numerous unrecorded archaeological sites and rock art panels.

The extent of cumulative effects on cultural resources could be reduced significantly through avoidance and the implementation of selective mitigation measures. Potential impacts on cultural resources in this area would be incremental and the potential to mitigate impacts on archaeological and historical sites is good. The indirect cumulative effects on cultural resources, as a result of increased public access, would be expected to be low.

4.3.18.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

The introduction of additional development could alter the setting and feeling of numerous NRHP eligible archaeological sites, as well as significant historic properties along the COUT alternative routes (including route variations), such as the old Victory Highway, U.S. Highway 6, the Buckhorn Flat Railroad, the D&RGW Railway, 23 NRHP-listed historic properties, a designated TCP (Ute vision quest site [42UT395]), Argyle Canyon Rock Art (Archaeological Sites), and Nine Mile Canyon ACEC in Utah; and the old Victory Highway in Colorado. NRHP-listed historic properties, as described in the cultural resources inventory summary in Section 3.2.18.5.2, include 14 historic buildings (residential), 2 historic post offices (Helper Main and Nephi Main), 1 historic farmstead, Fountain Green Hydroelectric Plant Historic District, Clerico Commercial Building, Helper Commercial District, Juab County Jail, Martin Millarich Hall, Mount Pleasant Carnegie Library, Mount Pleasant Commercial Historic District, Mount Pleasant High School Mechanical Arts Building, Mount Pleasant National Guard Armory, and the Wasatch Academy.

As a result of the presence of existing development projects and proposed future actions, including, but not limited to the TransWest Express Transmission Project and the Victory Pipeline Project, numerous known cultural resources and potentially significant cultural resources could be negatively affected throughout this portion of the Project area. If colocated, the TransWest Express Transmission Project could have a negative impact on many of the same cultural resources that would be affected by the Project.

Overall, the addition of the Project to past and RFFAs would result in a greater potential for cumulative effects on numerous known culturally significant resources, including the designated TCP, and other potentially significant cultural resources or historic properties that could be considered NRHP eligible, or could be determined as eligible for listing in the NRHP. For areas adjacent to Nine Mile Canyon and its tributary canyon branches, including Argyle Canyon, there is a high potential for encountering numerous unrecorded cultural resource sites (e.g., rock art panels, habitations, ceremonial sites, and potential TCPs).

The extent of cumulative effects on cultural resources could be reduced significantly through avoidance and the implementation of selective mitigation measures. Potential impacts on cultural resources in this area would be incremental and the potential to mitigate impacts on archaeological and historical sites is good. The indirect cumulative effects on cultural resources, as a result of increased public access, would be expected to be low.

4.3.19 Fire Ecology and Management

The approach for analysis of cumulative effects on fire ecology and management, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.19.5) and considers them in conjunction with the past, present, RFFAs listed in Tables 4-1 and 4-2.

The cumulative effects analysis area for fire ecology and management is the same as the Project area. The potential cumulative effects of the Project that may be shared with the effects of the past, present, and RFFAs listed in Tables 4-1 and 4-2 are discussed in general, as they may occur at nearly any location in the Project area.

4.3.19.1 Issues Identified for Analysis

4.3.19.1.1 Potential Impacts on Fire Risk

The Project would contribute to the ongoing, widespread human-caused changes in fire ecology throughout the Project area. Many past, present, and reasonably foreseeable future activities listed in Tables 4-1 and 4-2 can affect fire frequency and intensity through changes in vegetation cover, and may increase the risk of fire ignition.

4.3.19.1.2 Potential Impacts on Wildland Fire Suppression at Wildland-urban Interface

The existing wildland-urban interface creates a complex, challenging environment for wildland fire suppression, where human safety, property, and infrastructure are at the highest risk. Ongoing and future activities, including the proposed Project, are expected to continue to expand the wildland-urban interface and increase values to be protected during wildland fires.

4.3.19.2 Existing Condition

Past and present activities listed in Table 4-1 have modified fire ecology directly and indirectly throughout the CIAA. Agriculture, urban and rural residential developments, oil and gas production, and

other activities have all contributed to a complex, expanding wildland-urban interface. Some of these activities, such as agriculture and oil or gas development, have a higher risk of spreading invasive weeds and altering fire ecology. Other activities, such as rural residential development, create substantial values to be protected during wildland fires while increasing the risk to health and safety. The impact of all of these activities is to create an environment where management of fire for the benefit of resources may be highly constrained, but where the absence of fire over long time periods increases the risk that when fires do occur, fuel loads and fire intensity are often unnaturally high and suppression may be very difficult.

4.3.19.3 Results

4.3.19.3.1 Cumulative Effects on Fire Ecology and Ignition Risk

As discussed in Section 3.2.19, human activities such as agriculture have a very high potential to spread invasive plants that may alter fire ecology. However, all cumulative activities identified in Tables 4-1 and 4-2 that cause ground disturbance or have the potential to transport the seeds of invasive plants also have some potential to contribute to further changes in the natural fire regime. Transmission lines and gas pipelines create long, linear corridors that may facilitate the local spread of invasive plants, and the Project would potentially contribute to the cumulative effects on fire ecology of all other past, present, and RFFAs through this mechanism.

Some FMPs provide information on wildland fire causes in FMUs crossed by the Project. Where provided, this information indicates that, while wildland fires in FMUs with little development are typically ignited by lightning, fires in FMUs with an extensive wildland-urban interface may be ignited by human causes more often than by lightning. Insufficient information is available to discuss whether certain types of development are more likely than others to increase the risk of human-caused wildland fires, but increasing development in general is expected to continue to increase the cumulative risk. Construction of the Project and RFFAs would increase the number of roads, create new roads in areas previously without access, and contribute incrementally to the potential for accidental wildland fire ignitions.

4.3.19.5.2 Cumulative Effects on Fire Suppression

Human safety is the overriding concern of all wildland fire suppression activities. Secondary to safety concerns, protection of resources and property are considered when developing management objectives and allocation of responding personnel or equipment for each wildland fire. Past and present developments and linear utilities, when adjacent to burnable vegetation, can affect the response to a wildland fire. Existing roads and new roads created for future developments, potentially including the proposed Project, may provide access for ground crews, but protection of buildings and utilities may divert efforts from containment or suppression elsewhere. Construction of the Project and any RFFAs, including additional transmission lines, would further increase these effects.

As discussed in in Section 3.2.19, overhead utilities such as transmission lines pose a direct hazard to fire suppression personnel through the risk of equipment failure during a fire, or through arcing where the increased moisture and particles in smoke can carry electrical currents. Overhead utilities also create a hazard to aircraft responding to a fire. These risks may be mitigated by constructing multiple utilities in a shared corridor, minimizing the total area where hazards to ground crews and aircraft are present.

4.3.20 Socioeconomics

The approach for analysis of cumulative effects on socioeconomics, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of

direct and indirect impacts from the Project (refer to Section 3.2.20) and considers them in conjunction with the past, present, RFFAs listed in Tables 4-1 and 4-2.

4.3.20.1 Issues Identified for Analysis

Socioeconomic issues that could be cumulatively affected by the Project and past, present, and future actions include recreational values and visitor spending, housing and public services, impacts on environmental justice populations, property values, and future business and industrial activity.

4.3.20.1.1 Effects on Recreational Values and Local Tourism

The development and operation of the transmission line could diminish the natural appearance and the undeveloped character of recreation areas, which could have detrimental effects on recreation values. Additional industrial and commercial development also could adversely affect these resources, cumulatively affecting recreational values. If visitation were to decrease due to the presence of the transmission line and other industrial development, this potentially could affect visitor spending and the local economy.

4.3.20.1.2 Availability of Employment for Local Workforce

Transmission line construction activity would expand regional economic development through increased employment and income in the region. As construction workers spend their money in the local area, revenues would likely increase for local businesses (e.g., hotels, restaurants, gas stations, and grocery stores), supporting jobs, and incomes for these businesses and their employees. In remote areas across the study area, it is likely that construction workers would temporarily live in proximate communities during construction. The potential for cumulative socioeconomic impacts from implementing the Project exist where there are multiple projects proposed in an area that have overlapping construction schedules and/or project operations that could affect similar resources. Concurrent and similar projects could result in a demand for labor that cannot be met by the region's labor pool, which could lead to an influx of nonlocal workers. Socioeconomic resources potentially affected could include the availability of housing and accommodations as well as the availability of public and social services to accommodate the temporary workers.

4.3.20.1.3 Potential Impacts on Environmental Justice Populations of Concern

Potential environmental justice populations of concern residing in proximity to the transmission line routes could be cumulatively adversely affected by the construction and/or development of other proximate projects, with disproportionate impacts such as traffic, air quality, visual resources, cultural resources, property values, and agricultural land uses.

4.3.20.1.4 Potential Impacts on Private Property Values

Proximate residences to the transmission line may incur adverse effects on their property values. Additional proximate industrial construction and operations, such as other transmission lines, pipelines, oil and gas development, etc., may cumulatively affect these residential property values.

4.3.20.1.5 Potential Impacts on Local Businesses and Existing and Future Economic Development

Rangeland and cropland could be disturbed on private lands as well as in grazing leases on USFS- or BLM-administered land. Additional development in the Project right-of way, such as pipelines and other transmission lines, could also adversely affect these ranching resources. Additionally, the location of the development of new oil and gas wells would be restricted by the right-of-way, which may decrease oil and gas investment in certain locations, with potential impacts on the local economies.

4.3.20.2 Existing Condition

The existing social and economic conditions are discussed in detail in Section 3.2.20.3.

4.3.20.3 Results

There are two types of effects that could have implications for cumulative effects on socioeconomic resources. Construction activity has the potential to temporarily affect socioeconomic resources, including recreational and scenic values; construction workforce effects on housing and public services; and property effects (e.g., traffic, dust). Industrial development and/or operations and activity in proximity to the Project, which causes long-term scenic, visual, or physical obstructions, could have implications for aesthetic and recreational values and residential property values, and have the potential to restrict the location of future business or industrial development. The potential cumulative impacts associated with these activities could occur across the socioeconomic study area. Past, present, and future projects that could affect these resources are described in this section.

Environmental justice populations are expected to benefit from the Project through jobs, income, and fiscal receipts to local governments. These populations are not anticipated to be disproportionately and adversely affected by the Project and, therefore, the Project is not anticipated to cumulatively affect these populations.

4.3.20.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

There are a number of projects in the area that could result in cumulative effects in southwestern Wyoming and northwestern Colorado. The following projects have been identified that potentially have similar construction schedules and/or the industrial activity or development would occur in proximity to the Project.

Present or future construction and/or proximate industrial activity are expected for the following multi-state projects in this region in Wyoming and Colorado:

- Gateway West 500kV Transmission Project (multi-state)
- TransWest Express Transmission Project (multi-state)

Present or future construction and/or proximate industrial activity are expected for the following Wyoming projects in this region:

- Oil and gas development in southwestern Wyoming
- Wind-energy facility development (Chokecherry and Sierra Madre Wind Farm, Seven Mile Hill Wind Energy Facility, Dunlap I Wind Farm, Whirlwind I, Quaking Aspen Mountain, White Mountain Wind Farm, and Sweeney Ranch)
- Coal and noncoal mine development
- Residential developments

Present or future construction and/or proximate industrial activity are expected for the following Colorado projects in this region:

- Oil and gas development in northwestern Colorado
- Oil shale and tar sands development
- Coal and noncoal development projects
- Residential developments

Construction activity has the potential to temporarily affect properties, recreational and scenic values, and bring temporary construction workforce to local communities, requiring housing and public services. It is possible that the construction associated with these present and future activities, including transmission, wind facilities, oil and gas resources, oil shale, and mining resources, would require similar construction schedules that may overlap with the Project. As a result, the construction schedules of the Project, when added to these schedules, could lead to cumulative effects. Some of these projects would be expected to draw on the regional construction workforce in southwestern Wyoming and western Colorado, where there is considerable supply of construction workers. The cumulative demand for laborers in construction would likely require additional workers to temporarily relocate from the Denver and Salt Lake City regions and possibly elsewhere to fill these positions. This would result in an increase in temporary population across this region and an increased demand on housing, services and infrastructure, including road maintenance, emergency services, and municipal and county resources.

The construction workers needed for all of these cumulative projects, along with those required for the Project, could add to stresses on housing, services and infrastructure if construction schedules coincide, requiring an influx of temporary workers. Municipal and county services, including public service provisions such as education, road repair and construction, police and law enforcement, judicial facilities and services, medical services and facilities, emergency services, and other social services can all be expected to increase driven by the growing workforce and population, even if it is temporary in nature. Additionally, average earnings may also be driven up by higher-paying oil industry jobs.

The location of where these temporary residents would be housed is not known for this Project nor is it known for future development activities. To the extent that larger towns and cities could be used for temporary housing with perhaps greater capacity to absorb these residents and the spreading of workers' temporary residences across these towns and cities to diffuse the impact, this would mitigate the adverse effects on the availability of housing and public services. In Wyoming where there are multiple existing and future wind facility developments occurring and expected in the foreseeable future near the communities of Aeolus, Hanna, Sinclair, Rawlins, and Wamsutter, it may be the case that these communities are near housing and accommodations capacity. To the extent that the Applicant can locate its workers so as to not cumulatively affect these communities, this could mitigate these adverse effects on housing and public services. Additionally, the Applicant could provide temporary housing and basic services to its workers to mitigate these effects on communities, housing, and public services.

The transmission construction jobs associated with the proposed project would be a temporary impact on these communities, and permanent increases in residents to these areas are not expected to directly result from the proposed Project. Regionally, the construction of the Project would have temporary and low adverse effect on population, housing, and public services and infrastructure. However, on a more local level, these effects could be considerable, especially when considered with the present and future cumulative construction actions and projects. During the construction period, the cumulative impacts associated with the proposed Project on infrastructure, public services, and housing are expected to be moderate, short-term, and adverse. However, these adverse effects on housing and public services could be mitigated, as discussed above.

These temporary workers often bring their wages and spending to remote communities who welcome the stimulus to their economies. The cumulative beneficial impact of the Project on the social and economic conditions in the region could be significant, including business revenues, employment, income, fiscal receipts, and increased electrical reliability. In addition, indirect cumulative effects range from increases in housing stock to job growth. If current trends continue, the three state's economies will continue to grow, the population will increase, government services will expand, and the housing stock will increase. This project would not induce this growth; however, this Project would accommodate the increased demand that would be placed on the current electrical system.

The proximity of industrial or commercial activities to the Project could cumulatively affect property values, scenic and recreational values, and possibly affect the location of future business and commercial activity. Very few properties are located in proximity to Alternatives WYCO-B, WYCO-C, and WYCO-F (2 residences within 0.1 of a mile and 3 to 4 residences within 0.25 mile), resulting in minimal adverse effects on the property values associated with the Project. Alternative WYCO-D has 10 and 50 residences within 0.1 mile and 0.25 mile, respectively. Since property values are most affected within 0.25 mile or less of a transmission line or other industrial development, the specific siting of the Gateway West transmission line between Aeolus and Wamsutter and the TransWest Express Transmission Project between Rawlins and south to the Utah border in proximity to the Project would have the greatest potential to cumulatively affect these property values. With the bulk of Alternative WYCO-D proximate properties near Craig, Colorado, the siting of the TransWest Express Transmission Project along this alternative route and corridor may cumulatively adversely affect the proximate property values. Other wind power, oil and gas resource development could affect property values if located very near to the Project and residences, although this is not likely to occur. Again, topography, landscaping, and visual obstructions may lessen these effects, and the property value effects tend to dissipate over time. The cumulative transmission line development and activity if sited along the Alternative WYCO-D, when combined with the Project, would moderately and adversely affect these property values around Craig, Colorado, potentially affecting 50 residences within 0.25 mile. The remainder of the WYCO alternative routes would have minimal adverse impacts on residential property values.

Residential and commercial properties could be adversely affected by construction of other transmission lines, oil and gas and shale resources, wind power facilities, residential developments, and other transportation and industrial facilities from increased traffic, noise, dust, and other construction inconveniences. Construction activities associated with the Project and cumulative actions and activities could also temporarily adversely affect scenic and aesthetic values, with the potential to adversely affect visitor experiences and recreation values. Since construction activities are anticipated to be temporary, there would be minimal short-term adverse impacts on properties and scenic and recreational values. However, when combined with multiple construction projects, these adverse effects could be more profound and extended for a relatively longer period of time. However, the Project's contribution to these cumulative impacts would be short term and minor.

The existence and operation of transmission lines also have the potential to displace future industrial and commercial development. However, the industrial restrictions would apply only to the right-of-way, which would be at most 250 feet wide. The placement of new oil and gas well potentially could be affected by the Project, although the location of the development of new wells would be constrained only by the right-of-way, and the impacts would be low since the extraction of oil can usually occur from multiple locations in and above reserves.

4.3.20.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

There are a number of projects in the area that could result in cumulative effects in eastern Utah in proximity to the COUT BAX alternative routes. These projects have been identified with the potential to have similar construction schedules and/or the industrial activity or development would occur in proximity to the Project.

Present or future construction and/or proximate industrial activity are expected for the following multi-state projects in this region in eastern Utah:

- Enterprise Mid-America Pipeline Western Expansion II Project (multi-state)
- TransWest Express Transmission Project (multi-state)

Present or future construction and/or proximate industrial activity are expected for the following Utah projects:

- Oil and gas development
- Oil shale and/or tar sands development
- Pipeline development
- Transmission projects
- Wind energy facilities (near Castle Dale)
- Coal and noncoal mine development
- Flatirons Resource Helium Well Project
- Industrial facilities (power) near Green River
- Pumped-storage transmission line project (near Mona)
- The Narrows Dam and Reservoir project
- Road developments
- Residential developments

Many of these effects would be the same as those described for the WYCO alternative routes. Only those aspects that are different for this region are described here.

Some of these present and future actions and projects would be expected to draw on the regional construction workforce in western Colorado and eastern and central Utah where there is a supply of available construction workers (refer to Section 3.2.20). The cumulative demand for laborers in construction would likely require additional workers to temporarily relocate from the Denver and Salt Lake City regions and possibly elsewhere to fill these positions. This would especially be the case in the communities further away from the Salt Lake City urban area where construction workers would need to reside temporarily to support construction activities.

This would result in an increase in temporary population across this region and an increased demand on housing, services and infrastructure, including road maintenance, emergency services, and municipal and county resources. The construction workers needed for all of these cumulative projects, along with those required for the Project, could add to stresses on housing, services and infrastructure if construction schedules coincide, requiring an influx of temporary workers. Many of the communities along the COUT BAX alternative routes are small and remote, and a large influx of temporary residents may not be able to be accommodated in many of these small rural towns. The location of where these temporarily residents would be housed is not known for this project nor is it known for future development activities. To the extent that larger towns and cities could be used for temporary housing with perhaps greater capacity to absorb these residents and spreading workers' temporary residences across these towns and cities to diffuse the impact, this would mitigate the adverse effects on the availability of housing and public services. Grand Junction, Colorado and Green River and Price, Utah are relatively larger communities along the COUT BAX routes. Additionally, the Applicant could provide temporary housing and basic services to its workers to mitigate these effects on communities, housing, and public services, if needed.

The cumulative impacts associated with the proposed Project on infrastructure, public services, and housing are the same as described for the WYCO alternative routes, and are expected to be moderate, short-term, and adverse. However, these adverse effects on housing and public services could be mitigated, as discussed above.

The cumulative beneficial impact of the Project on the social and economic conditions in the Project area could be significant, including business revenues, employment, income, fiscal receipts, and increased electrical reliability, as described for the WYCO alternative routes.

The proximity of industrial or commercial activities to the Project could cumulatively affect property values, scenic and recreational values, and possibly affect the location of future business and commercial activity. Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E have 106 residences within 0.25 mile. Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E have 10, 10, and 17 residences within 0.1 of a mile, respectively.

Seventy-seven proximate residences (within 0.25 mile) are located very near Nephi, Utah. All Colorado-Utah alternative routes pass by these residences. The TransWest Express Transmission Project also is likely to be routed through this community, with the potential to cumulatively affect property values in this neighborhood. Alternatives COUT BAX-B and COUT BAX-C traverse near 10 residences close to Mount Pleasant, Utah. This is also a corridor through which the TransWest Express Transmission Project could also be located.

Alternative COUT BAX-E is located in proximity to 10 residences near Fairview, Utah, and this is also an alternate route being considered for the TransWest Express Transmission Project. Other oil and gas resource development and industrial facilities could affect property values if located very near to the Project and residences. Again, topography, landscaping, and visual obstructions may lessen these effects, and the property value effects tend to dissipate over time. The cumulative transmission line development and activity if sited along the COUT BAX alternative routes, when combined with the Project, could have a substantial adverse effect on property values primarily located around the communities of Nephi, Mount Pleasant, and Fairview.

Properties could be adversely affected by the construction activity associated with cumulative actions and projects from increased traffic, noise, dust, and other construction inconveniences. Since construction activities are anticipated to be temporary, there would be minimal short-term adverse impacts on properties and scenic and recreational values. However, when combined with multiple construction projects, these adverse effects could be more profound and extended for a relatively longer period of time. The Project's contribution to these cumulative impacts would be short term and minor.

The existence and operation of transmission lines also have the potential to displace future industrial and commercial development. However, the impacts would be low since development would only be restricted to the right-of-way.

4.3.20.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

There are a number of projects in the area that could result in cumulative effects in eastern and central Utah in proximity to Alternatives COUT-B, COUT-C, COUT-H, and COUT-I. These projects have been identified with the potential to have similar construction schedules and/or the industrial activity or development would occur in proximity to the Project.

Present or future construction and/or proximate industrial activity are expected for the TransWest Express Transmission Project (multi-state project) in this region in eastern and central Utah.

Present or future construction and/or proximate industrial activity are expected for the following Utah projects in this region:

- Oil and gas development
- Oil shale and/or tar sands development
- Pipeline development
- Transmission projects
- Coal and noncoal mine development
- Pumped-storage transmission line project (near Mona)

- The Narrows Dam and Reservoir project
- Road developments
- Residential developments

Many of these effects would be the same as those described for the Utah portions of the COUT BAX alternative routes. Only those aspects that are different for this region are described here.

The construction schedules of the Project, when added to the construction schedules of present and future actions and projects, could lead to cumulative effects. Some of these projects would be expected to draw on the regional construction workforce in eastern and central Utah where there is a supply of construction workers. The project and cumulative demand for laborers in construction would likely require workers to temporarily relocate from the Denver and Salt Lake City regions and possibly elsewhere to fill these positions. This especially would be the case in the communities further from the Salt Lake City urban area where construction workers would need to reside temporarily to support construction activities. Many of the communities along the COUT alternative routes are small and remote, and a large influx of temporary residents may not be easily accommodated in many of these small rural towns. The location of where these temporarily residents would be housed is not known for this Project nor is it known for future development activities. To the extent that larger towns and cities could be used for temporary housing with perhaps greater capacity to absorb these residents and the spreading workers' temporary residences across these towns and cities to diffuse the impact, this would mitigate the adverse effects on the availability of housing and public services. Vernal, Roosevelt, and Price, Utah are relatively larger communities along the Alternatives COUT-A, COUT-B, COUT-C, COUT-H, and COUT-I. Additionally, the Applicant could provide temporary housing and basic services to its workers to mitigate these effects on communities, housing, and public services, if needed.

The construction of the Project would have temporary and low adverse effects on population, housing, and public services and infrastructure across the region. However, on a more local level, these effects could be considerable, especially when considered with the present and future cumulative actions and projects. The cumulative impacts associated with the proposed Project on infrastructure, public services, and housing is expected to be moderate, short-term, and adverse. However, these adverse effects on housing and public services could be mitigated, as discussed above.

The proximity of industrial or commercial activities to the Project cumulatively could affect property values, scenic and recreational values, and possibly affect the location of future business and commercial activity. Similar to the analysis for the COUT BAX alternative routes, all of the COUT alternative routes pass by within 0.25 mile of 77 residences near Nephi, Utah. The TransWest Express Transmission Project also is likely to be routed through this community, with the potential to cumulatively affect property values in this neighborhood.

Alternatives COUT-A, COUT-B, COUT-C, and COUT-H, and COUT-I have between 10 and 45 residences within 0.1 of a mile, and 98 to 214 residences within 0.25 mile. Alternative COUT-A has the greatest number of residences located within 0.25 mile, located near Strawberry Reservoir, Fruitland, Duchesne, and Roosevelt, a total of 214 residences. Alternative COUT-B has 199 residences within 0.25 mile, the majority of which are located in Roosevelt and southwestern Duchesne County. Alternative COUT-C has proximate residences in southwestern Duchesne County. The TransWest Express Transmission Project has alternative routes located along Alternatives COUT-A, COUT-B, and COUT-C (although a portion of Alternative COUT-B between Roosevelt and southwestern Duchesne county is not included within the TransWest Express alternative routes), with the potential to cumulatively affect these property values.

Alternative COUT-I has 99 proximate residences within 0.25 mile of the Project, some of which are located in southwestern Duchesne County. Alternative COUT-H has 147 proximate residences within

0.25 mile of the Project, some of which are located in southwestern Duchesne County and near Helper, Utah. These residences are also along the alternative routes being considered for the TransWest Express Transmission Project.

Other oil and gas resource development and industrial facilities could affect property values if located very near to the Project and residences. Again, topography, landscaping, and visual obstructions may lessen these effects, and the property value effects tend to dissipate over time. The cumulative transmission line development and activity if sited along the COUT alternative routes, when combined with the Project, could have a substantial adverse effect on property values. Residences close to the following communities would be affected—Nephi (all COUT BAX and COUT alternative routes and route variations), Roosevelt (Alternatives COUT-A and COUT-B), Upalco (Alternative COUT-A), Duchesne (Alternative COUT-A), Fruitland (Alternative COUT-A), Helper (Alternative COUT-H), Fairview (Alternative COUT-H), and southwestern Duchesne County (Alternatives COUT-B, COUT-C, COUT-H, and COUT-I).

Properties could be affected adversely by construction of cumulative actions and from the Project due to increased traffic, noise, dust, and other construction inconveniences. Since construction activities are anticipated to be temporary, there would be minimal short-term adverse impacts on properties and scenic and recreational values. However, when combined with multiple construction projects, these adverse effects could be more profound and extended for a relatively longer period of time. The Project's contribution to these cumulative impacts would be short-term and minor.

The existence and operation of transmission lines also have the potential to displace future industrial and commercial development. However, the impacts would be low since development would only be restricted to the right-of-way.

4.3.21 Public Health and Safety

The approach for analysis of cumulative effects on public health and safety, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.21.5) and considers them in conjunction with the past, present, and RFFAs listed in Tables 4-1 and 4-2.

4.3.21.1 Issues Identified for Analysis

Three issues were identified for which additional analysis of the potential cumulative effects of the operation of the proposed 500kV transmission line is required. For each of the issues, the question is whether operation of the proposed transmission line in proximity to other transmission lines would cause cumulative effects, i.e., the combined EMF, radio noise, and audible noise levels would rise above levels with a potential to produce adverse effects or device interference (EMF, radio noise) or annoyance (audible noise).

4.3.21.1.1 Electric and Magnetic Field Effects on Humans and Animals

EMF is produced by transmission lines, distribution lines, and all electrical devices supplied with electricity. Comparisons of calculated levels of EMF from the proposed 500kV transmission line to health-based exposure guidelines and an assessment of relevant literature did not identify any likely effects of EMF exposure on human or animal health.

4.3.21.1.2 Radio Noise Effects on Cellular Phone, Internet, Radio, or Television Reception

Radio noise from the proposed 500kV transmission line was calculated and found to be below recommended levels and not likely to be a source of interference to electrical devices, except to amplitude-modulated radio reception on the right-of-way.

4.3.21.1.3 Audible Noise Annoyance to Area Residents

Audible noise from the proposed 500kV transmission line was calculated and found to be below EPA-recommended levels on and beyond the right-of-way and not likely to be a source of annoyance to residents in proximity to the line.

4.3.21.2 Existing Condition

Thousands of miles of high-voltage alternating-current (AC) and direct-current (DC) transmission lines exist (Table 4-1), some of which may traverse the Project study area (Table 4-2). The levels of EMF, radio noise, and audible noise from these transmission lines are judged to be higher than other existing or potential sources identified; therefore, the focus of this analysis is on interactions of the proposed transmission line with these other transmission lines that might yield significant cumulative effects.

4.3.21.3 Results

The potential cumulative effects of EMF, radio noise, and audible noise with existing and proposed transmission lines were analyzed and the results are summarized in Table 4-3. As discussed below, no significant cumulative effects for these exposures were identified.

4.3.21.3.1 Past and Present Activities

Section 3.2.21 evaluated the proposed 500kV transmission line where it might parallel three existing AC transmission lines for significant distances (the interactions between transmission lines that cross over or under one another are negligible and highly localized). When located on separate but adjacent rights-of-way, the new transmission line was calculated to produce very small increases in the levels of EMF, radio noise, and audible noise such that the potential total impact of these adjacent sources (the Mona-Bonanza 345kV transmission line and two 138kV transmission lines—Spanish Fork to Carbon and Hayden to Artesia) would still be well below the designated guideline values for these exposures. It is important to understand that depending on the orientation, loading, and phasing of the conductors, the EMF from adjoining lines as vectors may result in EMF levels at locations that are higher (additive effect) or lower (partial cancellation effect) than the EMF from an existing or proposed transmission line alone. Nevertheless, despite the potential additive effect of two adjacent transmission lines, the total effect in the area between the transmission lines is calculated to always be less than in the area directly under the conductors of either transmission line.

Given that distances from centerlines to the edge of the rights-of-way are no less than 75 feet at 345kV, appropriately less for lower voltages, and a minimum of 112.5 feet for the only existing 500kV transmission line (Mona to Oquirrh), this assessment also applies to other existing AC transmission lines in the Project area (Table 4-3) operating at voltages from 20kV up to 345kV. Adding these distances to the 125 feet from the centerline of the proposed Gateway West transmission line to the edge of the right-of-way translates to a minimum separation distance of 200 feet between the proposed 500kV transmission line and existing transmission lines at greater than or equal to 345kV. If the proposed transmission line crosses such existing transmission lines, the potential affected area would be confined to a limited area of the right-of-way. In addition, combined effects of EMF, radio noise, and audible noise would be

minimized by the additional height above ground required for the proposed 500kV transmission line to cross above an existing transmission line.

4.3.21.3.2 Reasonably Foreseeable Future Actions

In the Project area, the two transmission lines with the highest voltages and longest lengths are the proposed Gateway West 500kV AC transmission line and the proposed TransWest Express 600kV DC transmission line (Table 4-129). It is clear from the modeling of total EMF from the proposed 500kV transmission line adjacent to the Mona to Bonanza 345kV transmission line (Appendix J, Figure J-2 and J-6) that if the 345kV transmission line were to be replaced with the proposed 500kV transmission line, the combined EMF levels at the edges of the rights-of-way would not exceed recommended guideline reference levels determined by the International Commission on Non-Ionizing Protection and the International Committee on Electromagnetic Safety. Thus, if the proposed 500kV transmission line were to parallel the proposed Gateway West 500kV transmission line, the cumulative effect would be very small and no adverse effects would be expected. If the proposed 500kV line were to operate on a right-of-way adjacent to the proposed TransWest Express transmission line, cumulative EMF effects would be even smaller because the 60-Hertz EMF from the AC transmission line and the 0-Hertz EMF from the DC transmission line will not combine such that guidelines for AC EMF or for DC EMF would be exceeded. The only interaction of the EMF from adjacent AC and DC transmission lines is the possibility of enhanced perception of the AC electric field in the presence of DC electric fields and air ions, but the distance between the conductors of the proposed 500kV AC transmission line and the TransWest Express transmission line would always be at least 150 feet (based on data in Table 4-2), so the effects of the two lines would not be cumulative (Chartier et al. 1981; Clairmont et al. 1989). Of the five potential future projects identified in Table 4-3, the minimum distance from the centerline to the edge of the right-of-way is 125 feet for four projects, which translates to a minimum separation distance of 250 feet from the proposed 500kV transmission line.

The analysis of audible noise and radio noise for existing and proposed transmission lines is similar to that presented above for EMF. Of note, the distances from the proposed 500kV transmission line evaluated here are similar to or greater than the critical distances for control of effects on audible noise identified in the Final EIS for the Gateway West transmission line (BLM 2011s). The opportunity for cumulative effects is slightly greater than for EMF, however, because of the slower diminution of audible noise and radio noise with distance compared to diminution of EMF with distance from transmission line conductors. The area of principal interest for the assessment of potential cumulative effects for audible noise and radio noise, however, is not on the rights-of-way of the transmission lines, but at residences away from the transmission lines. When two transmission lines are located on parallel, adjacent rights-of-way, the area with the greatest cumulative effect will be the small area on each right-of-way and between adjacent rights-of-way edges where the audible noise or radio noise from one transmission line adds to that from the other. Since no residences would be located in this area, the areas of concern where the use and enjoyment of property free from unacceptable audible noise or radio noise are limited to the opposite sides of the rights-of-way, where the influence of the adjacent transmission line is exceedingly small. If the proposed transmission line were to cross any of these future transmission lines, the potential area affected would be confined mostly to a limited area of the right-of-way and combined effects of EMF, radio noise, and audible noise would be reduced by the additional height above ground required for the proposed 500kV transmission line to cross above an existing transmission line.

TABLE 4-129 PUBLIC HEALTH AND SAFETY CUMULATIVE EFFECTS ANALYSIS		
Jurisdiction/ Agency	Applicant/Project Name	Significant Cumulative Effect (Yes/No)
Multi-State Activities		
Past and Present Activities¹		
Bureau of Land Management (BLM) Fillmore Field Office	PacifiCorp Mona to Oquirrh Transmission Project	No
	Intermountain Power Agency Intermountain Mona Lines No. 1 and 2	No
	PacifiCorp Camp Williams to Sigurd No. 1	No
	PacifiCorp Camp Williams to Sigurd No. 2	No
LANDFIRE™	Transmission lines throughout the Project area	No
Reasonably Foreseeable Future Activities		
BLM Wyoming State Office	Idaho Power and Rocky Mountain Power Gateway West 500-kilovolt (kV) Transmission Project	No
BLM Wyoming State Office	TransWest Express, LLC TransWest Express 600kV Transmission Project	No
Utah		
Federal		
BLM Fillmore Field Office	Mona North Pumped Storage Project	No
BLM Fillmore Field Office	Mona South Pumped Storage Project	No
NOTE: Past and Present Activities include authorized activities that may or may not have been built to date but could be built at anytime		

4.4 Irreversible and Irretrievable Commitment of Resources

Resources committed to the proposed Project would be material and nonmaterial, including financial resources. Irreversible commitment of resources for the purposes of this section has been interpreted to mean that those resources once committed to the proposed Project would continue to be committed throughout the life of the Project (50 years) or longer if the Project was not decommissioned. Irretrievable commitment of resources has been interpreted to mean that those resources used, consumed, destroyed, or degraded during construction, operation, maintenance of the proposed Project could not be retrieved or replaced for future use. Irreversible and irretrievable commitments of resources for the Project are summarized in Table 4-130.

TABLE 4-130 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES			
Resource	Type of Commitment/ Reason for Commitment	Irreversible	Irretrievable
Air quality	- Degradation of air quality - Construction activities	No	Construction phase
Soils	- Soil loss and erosion - Construction activities	Yes	Yes
Water	None (refer to construction materials section)	–	–
Biological	- Disturbance to and/or loss of vegetation, habitat, and wildlife species - Construction and operation	Yes	Project life

TABLE 4-130 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES			
Resource	Type of Commitment/ Reason for Commitment	Irreversible	Irretrievable
Archaeological and historical sites	▪ Disturbance or removal of sites ▪ Construction, operation, and maintenance	Yes	Yes
Important cultural sites	▪ Disturbance or removal of sites, interference with visual setting ▪ Construction, operation, and maintenance	Yes	Project life
Traditional cultural properties	▪ Disturbance or removal of sites, interference with visual setting, aural disturbance ▪ Construction, operation, and maintenance	Yes	Project life Construction phase
Paleontological resources	▪ Disturbance or removal of fossils ▪ Construction activities	Yes	Yes
Visual resources	▪ Degradation of natural scenic quality, viewshed intrusion ▪ Construction and operation	Yes	Project life
Land use and recreation resources	▪ Disturbance to agriculture and grazing ▪ Exclusion of residential, institutional, and industrial uses ▪ Increased recreational use along new access roads ▪ Increased access construction ▪ Construction and operation	Yes	Project life
Public health	▪ Potential adverse electrical effects ▪ Operation	Unknown	Unknown
Noise	▪ Noise exceeding ambient levels ▪ Construction and operation	Yes No	Construction phase
Social and economic conditions	▪ Increased regional and local employment and revenues ▪ Construction and operation	Yes	Project life
Construction materials and fuels	▪ Use of: ○ Aggregate ○ Water ○ Steel ○ Aluminum ○ Concrete ○ Wood ○ Fossil fuels	Yes Yes Yes Yes Yes Yes Yes	Yes Yes No No Yes No Yes

CHAPTER 5 – LAND-USE PLAN AMENDMENTS

As proposed, the Project would cross three states—Wyoming, Colorado, and Utah—including federal lands administered by 10 BLM field offices (Rawlins, Little Snake, White River, Grand Junction, Vernal, Moab, Price, Salt Lake, Richfield, and Fillmore Field Offices) and three national forests (Ashley, Uinta-Wasatch-Cache, and Manti-La Sal National Forests). Both the BLM and USFS land use planning regulations (43 CFR 1610.5 and 36 CFR 219.10) require that site-specific decisions, including authorized uses of land, be consistent with the applicable plan. If a proposed site-specific decision is not consistent with the applicable plan, the responsible official may modify the proposed decision to make it consistent with the plan, reject the proposal, or amend the plan to authorize the action. As a result, the amendment of multiple BLM RMPs and USFS LRMPs (land use plan amendments [LUPAs]) may be necessary before the project can be authorized.

For some specific portions of the Project along alternative routes, where avoidance was not possible or where application of all feasible mitigation measures was determined through project-specific analysis to be insufficient to bring the Project into conformance with the administering federal agency’s land-use plan, a LUPA would be required to amend decisions in the land-use plans to accommodate the Project. Each nonconformance potentially caused by the Project’s alternative routes was identified through a comparison of the Project’s alternative route(s) to the respective land use plan. A LUPA that would allow plan consistency with authorization of the alternative route(s) is presented as the potential LUPA for that situation. LUPAs would only be implemented for the Project-specific selected alternative route.

The discussion in this chapter describes the process for amending BLM- and USFS-land use plans and identifies potential LUPAs required for each alternative route, followed by an analysis of the potential environmental impacts associated with each LUPA. The locations associated with the potential LUPAs are presented on Maps 5-1a and 5-1b.

5.1 Planning Process

The BLM prepares RMPs for public lands in accordance with the requirements of FLPMA Sections 201 and 202 (43 U.S.C. 1711-1712) and the regulations in 43 CFR 1600. The BLM Land Use Planning Handbook (BLM Manual H-1601-1) provides specific guidance for preparing, amending, revising, and maintaining BLM land use plans (BLM 2005a). The BLM’s land use planning regulations at 43 CFR 1610.5-5 state, “an amendment shall be initiated by the need to consider a Proposed Action that may result in a change in the scope of resources uses or a change in the terms, conditions, and decisions of the approved plan.” Plans needing amendment may be grouped geographically or by type of decision in the same amendment process. One amendment process may amend the same or related decisions in more than one land use plan. An overview of the NEPA and land-use plan amendment process is presented in Section 1.5.

The USFS land use planning regulations at 36 CFR 219.13 state, “a plan amendment is required to add, modify, or remove one or more plan components, or to change how or where one or more plan components apply to all or part of the plan area (including management areas or geographic areas)”. An amendment decision shall “base an amendment on a preliminary identification of the need to change the plan. The preliminary identification of the need to change the plan may be based on a new assessment; a monitoring report; or other documentation of new information, changed conditions, or changed circumstances.” The plan must be amended “consistent with Forest Service NEPA procedures. The appropriate NEPA documentation for an amendment may be an environmental impact statement, an environmental assessment, or a categorical exclusion, depending upon the scope and scale of the amendment and its likely effects.” In developing an amendment, the responsible official shall “provide

opportunities for public participation as required in §219.4 and public notification as required in §219.16."

5.1.1 Planning Area Boundaries

Most of the LUPAs needed to bring the Project's alternative routes into conformance would be limited to the specific portions of the 250-foot right-of-way for the transmission line and the boundaries of ancillary facilities that would not be in conformance with the applicable land-use plan. In this case, the planning area boundaries are limited to the proposed 250-foot right-of-way on lands administered by the relevant BLM field office or national forest. For amendments to change the designation of a utility corridor for underground utilities only to allow both underground and overhead utilities or widen an existing utility, the planning area boundary is the extent of the modified utility corridor.

5.1.2 Planning Issues and Criteria

A list of the issues identified from scoping is presented in Table 1-1. The following general planning criteria were developed for the potential LUPAs to help focus analysis of the impact of amending the various land use plans.

- Actions must comply with laws, executive orders, regulations, and policy.
- The planning effort recognizes valid existing rights.
- The LUPA will apply only to the BLM- and USFS-administered lands within the planning area boundaries and any lands that may affect or be affected by the management in the planning area. Within the planning area, management decisions will not apply to private or tribal lands, mineral estates, or public lands administered by other federal agencies, or the federal mineral estate underlying public lands administered by other federal agencies.
- To the extent possible, and within legal and regulatory parameters, management and LUPA decisions will be consistent with officially approved or adopted resource-related plans, and the policies and programs contained therein, of other federal agencies, state and local governments and Indian tribes, so long as the guidance and resource management plans also are consistent with the purposes, policies and programs of federal laws and regulations applicable to federal lands, including federal and state pollution control laws as implemented by applicable federal and state air, water, noise, and other pollution standards or implementation plans.
- Planning and management direction will be focused on the relative values of resources and not the combination of uses that will give the greatest economic return or economic output.
- Existing endangered species recovery plans, including plans for reintroduction of endangered species and other species, will be considered. Consultation, coordination and cooperation with the FWS will be in accordance with interagency memorandums of understanding regarding Section 7 Consultation. Applicable biological opinions regarding areas within the planning area also will be considered.

5.1.3 Potential Land-use Plan Amendments

Table 5-1 lists the resource management plans by state that could require an amendment, the identified nonconformance issue, and the applicable alternative routes relative to the potential LUPAs. Complete descriptions of the potential LUPAs and associated effects are discussed in Tables 5-2 through 5-33.

The types of potential LUPAs needed to address nonconformance include:

- Conversion of underground utility corridors to allow aboveground utilities

- Changing VRM classifications (BLM)
- Changing VQO classifications (USFS)
- Granting a one-time exception to allow a transmission line right-of-way to cross an ACEC if the ACEC can be spanned
- Widening portions of a utility corridor designated in a land-use plan to include the Project right-of-way.

5.1.3.1 Direct and Indirect Effects

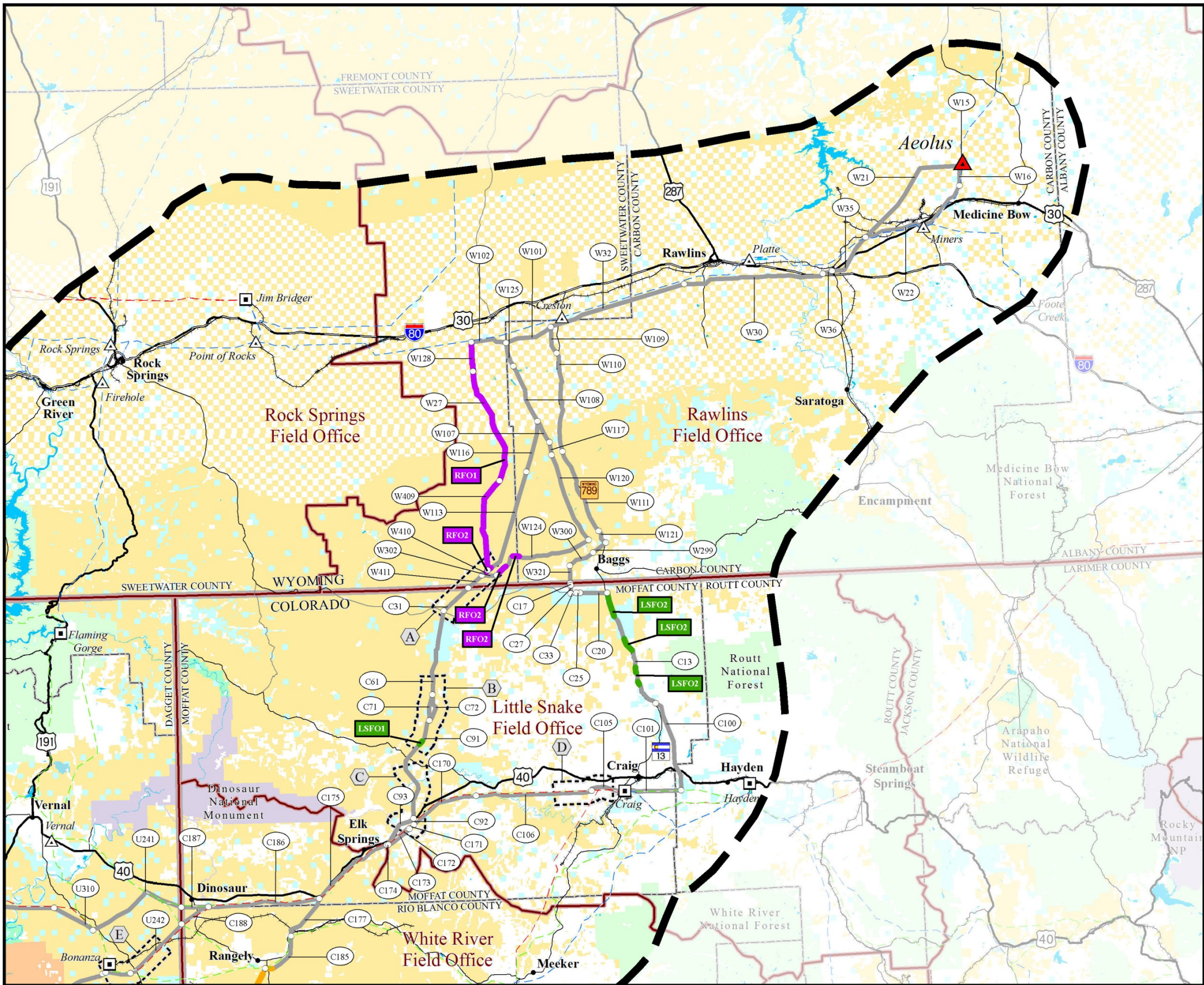
Because most of the planning boundaries are limited to the 250-foot right-of-way for the transmission line and the boundaries of ancillary facilities, the direct and indirect effects on the resources and resource uses from amending decisions in the land use plans to accommodate the Project would be similar to the direct and indirect effects of constructing, operating, and maintaining the Project described in Chapter 3. Refer to the following sections for discussion of direct and indirect effects for each resource:

- Climate and Air Quality (Section 3.2.1)
- Earth Resources (Section 3.2.2)
- Paleontological Resources (Section 3.2.3)
- Water Resources (Section 3.2.4)
- Vegetation (Section 3.2.5)
- Special Status Plants (Section 3.2.6)
- Wildlife (Section 3.2.7)
- Special Status Wildlife (Section 3.2.8)
- Fish and Aquatic Resources (Section 3.2.9)
- Land Use (Section 3.2.10)
- Parks, Preservation, and Recreation (Section 3.2.11)
- Transportation and Access (Section 3.2.12)
- Special Designations and Other Management Areas (Section 3.2.13)
- Wilderness, Wilderness Study Areas, and Non-Wilderness Study Area Lands with Wilderness Characteristics (Section 3.2.14)
- Inventoried Roadless Areas and Unroaded/Undeveloped Areas (Section 3.2.15)
- Visual Resources (Section 3.2.16)
- National Trails System (Section 3.2.17)
- Cultural Resources (Section 3.2.18)
- Fire Ecology and Management (Section 3.2.19)
- Social and Economic Conditions (Section 3.2.20)
- Public Health and Safety (Section 3.2.21)

The direct and indirect effects of the LUPAs are presented in Tables 5-2 through 5-33.

5.1.3.2 Cumulative Effects

Amended land-use plan direction resulting from amendment of land-use plan decisions to accommodate the Project (i.e., conversion of underground utility corridors to allow aboveground utilities, modifying visual resource classifications, granting a one-time exception to allow a transmission line right-of-way to cross an ACEC (if the ACEC can be spanned), or widening portions of an utility corridor designated in a land-use plan to include the Project right-of-way) could affect decisions regarding management of the adjacent areas in consideration of other RFFAs (i.e., future linear utilities, especially other overhead transmission lines). The cumulative effects of the proposed LUPAs are presented in Tables 5-2 through 5-33.



Map 5-1a Potential Plan Amendments Northern Area

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Potential Plan Amendments by Agency¹

# Reference Number (Refer to Table 5-1)	Pony Express RMP (Salt Lake Field Office [SLFO])
Ashley LRMP (ANF)	Price RMP (PFO)
Grand Junction RMP (GJFO)	Rawlins RMP (RFO)
Little Snake RMP (LSFO)	Uinta LRMP (UNF)
Manti-La Sal LRMP (MLSNF)	Vernal RMP (VFO)
Moab RMP (MFO)	White River RMP ² (WRFO)

Project Features

Project Area Boundary	345kV Proposed Rebuild (Segment 4a and 4b - Inset B)
Substation (Project Terminal)	345kV Proposed Reroute (Segment 4c - Inset B)
Alternative Route	Series Compensation Station Siting Area
Link Number	
Link Node	

Land Ownership

Bureau of Land Management	U.S. Fish and Wildlife Service
Bureau of Reclamation	U.S. Forest Service
Indian Reservation	State Land
National Park Service	Private Land
U.S. Department of Defense	

General Reference

City or Town	Interstate Highway
Substation	U.S. Highway
Power Plant	State Highway
500kV Transmission Line	Other Road
345kV Transmission Line	Lake or Reservoir
230kV Transmission Line	State Boundary
138kV Transmission Line	County Boundary
Railroad	BLM Field Office Boundary
	U.S. Forest Service Boundary ³

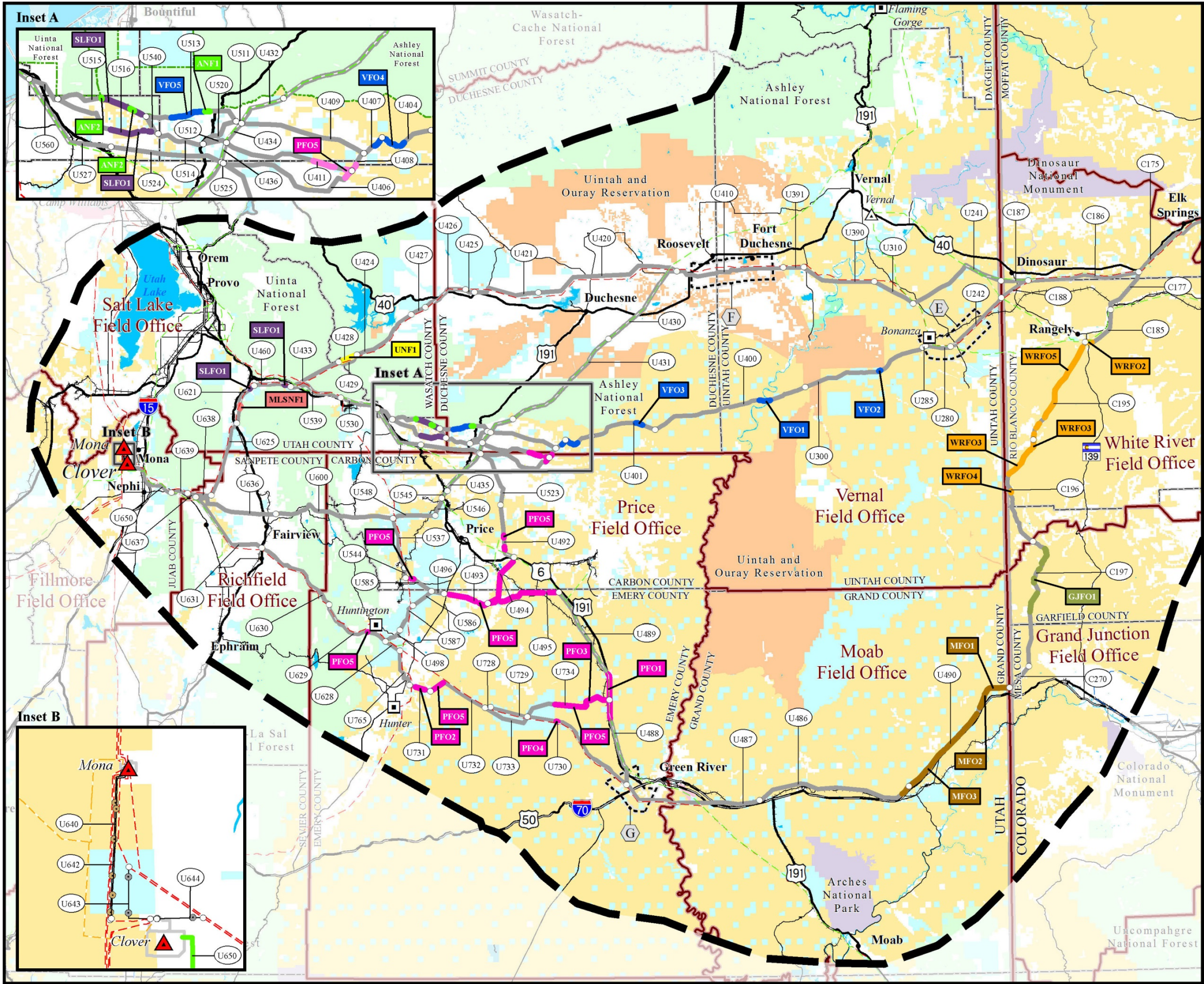
SOURCES:
Potential Plan Amendments, EPG 2013;
Series Compensation Station Siting Areas, Rocky Mountain Power 2013;
Land Jurisdiction, BLM 2010, 2011; City or Town, ESRI 2010;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
National Transportation Atlas Database, USDOT 2008;
Utah Highways and Roads, AGRC 2012; Water Features, ESRI 2008, USGS 2010a;
State and County Boundaries, ESRI 2008;
U.S. Forest Service Boundary, USFS 2006; BLM Field Office Boundary, BLM 2008

NOTES:
¹LRMP is the U.S. Forest Service Land and Resource Management Plan and
RMP is the Bureau of Land Management Resource Management Plan.
²The location(s) of potential plan amendment WRFO1 is not displayed; however,
the location(s) will be identified during surveys of the selected route.
³U.S. Forest Service boundary shown only within Inset A.
• The alternative routes and series compensation station siting areas shown on this map are
draft and may be revised and/or refined throughout the development of the Project.
• Substation symbols do not necessarily represent precise locations.

Alternative routes last revised: April 1, 2013

DRAFT EIS: February 2014





Map 5-1b

Potential Plan Amendments
Southern Area

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Potential Plan Amendments by Agency¹

#

Reference Number
(Refer to Table 5-1)

■

Ashley LRMP (ANF)

■

Grand Junction RMP (GJFO)

■

Little Snake RMP (LSFO)

■

Manti-La Sal LRMP (MLSNF)

■

Moab RMP (MFO)

■

Pony Express RMP
(Salt Lake Field Office [SLFO])

■

Price RMP (PFO)

■

Rawlins RMP (RFO)

■

Uinta LRMP (UNF)

■

Vernal RMP (VFO)

■

White River RMP² (WRFO)

Project Features

▬

Project Area Boundary

▲

Substation (Project Terminal)

—

Alternative Route

○

Link Number

○

Link Node

—

345kV Proposed Rebuild
(Segment 4a and 4b - Inset B)

—

345kV Proposed Reroute
(Segment 4c - Inset B)

⊖

Series Compensation
Station Siting Area

Land Ownership

■

Bureau of Land Management

■

Bureau of Reclamation

■

Indian Reservation

■

National Park Service

■

U.S. Department of Defense

■

U.S. Fish and Wildlife Service

■

U.S. Forest Service

■

State Land

■

Private Land

General Reference

●

City or Town

▲

Substation

■

Power Plant

—

Interstate Highway

—

U.S. Highway

—

State Highway

—

Other Road

—

500kV Transmission Line

—

345kV Transmission Line

—

230 Transmission Line

—

138 Transmission Line

—

Railroad

■

Lake or Reservoir

—

State Boundary

—

County Boundary

—

BLM Field Office Boundary

—

U.S. Forest Service Boundary³

SOURCES:

Potential Plan Amendments, EPG 2013;

Series Compensation Station Siting Areas, Rocky Mountain Power 2013;

Land Jurisdiction, BLM 2010, 2011; City or Town, ESRI 2010;

Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;

National Transportation Atlas Database, USDOT 2008;

Utah Highways and Roads, AGRC 2012; Water Features, ESRI 2008, USGS 2010a;

State and County Boundaries, ESRI 2008;

U.S. Forest Service Boundary, USFS 2006; BLM Field Office Boundary, BLM 2008

NOTES:

¹LRMP is the U.S. Forest Service Land and Resource Management Plan and RMP is the Bureau of Land Management Resource Management Plan.

²The location(s) of potential plan amendment WRFO1 is not displayed; however, the location(s) will be identified during surveys of the selected route.

³U.S. Forest Service boundary shown only within Inset A.

The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Substation symbols do not necessarily represent precise locations.

Alternative routes last revised: April 1, 2013

DRAFT EIS: February 2014

0 5 10 20 30

Miles

**TABLE 5-1
POTENTIAL LAND-USE PLAN AMENDMENTS**

Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
Wyoming					
Bureau of Land Management Rawlins Field Office					
Record of Decision and Approved Rawlins Resource Management Plan (Bureau of Land Management [BLM] 2008b)	Yes	 RFO1	5-2	The alternative route is located within the Colorado Interstate Gas/Entegra/Wyoming Interstate Company pipeline corridor, which is designated for underground utilities only.	WYCO-C and all route variations
	Yes	 RFO2	5-3	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Cherokee Historic Trail in these areas would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix H – Contrast Rating Sheet Worksheet, Key Observation Point (KOP) #276.	WYCO-B, WYCO-C, and WYCO-F and all route variations
Colorado					
Bureau of Land Management Little Snake Field Office					
Little Snake Record of Decision and Approved Resource Management Plan (BLM 2011b)	Yes	 LSFO1	5-4	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Godiva Rim Proposed Backcountry Byway would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #289.	WYCO-B, WYCO-C, and WYCO-F and all route variations
	Yes	 LSFO2	5-5	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Colorado State Highway 13 would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #66, and associated visual simulation.	WYCO-D and all route variations

**TABLE 5-1
POTENTIAL LAND-USE PLAN AMENDMENTS**

Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
Bureau of Land Management White River Field Office					
White River Field Office Record of Decision and Approved Resource Management Plan, 1997, as amended (BLM 1997)	Yes	 WRFO1	5-6	All suitable habitat for listed and candidate plant species are exclusion areas for new rights-of-way authorizations.	Unknown
	Yes	 WRFO2	5-7	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Dinosaur Diamond Scenic Byway in Canyon Pintado would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #241, and associated visual simulation.	All COUT BAX alternative routes
	Yes	 WRFO3	5-8	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Baxter Pass Road would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #244, and associated visual simulation.	All COUT BAX alternative routes
	Yes	 WRFO4	5-9	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, visual effects resulting from the proximity of the Project to a residence in Whiskey Creek would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #242.	All COUT BAX alternative routes
	Yes	 WRFO5	5-10	The alternative routes follow the Dragon Trail-Atchee Ridge utility corridor, which is designated for underground utilities only.	All COUT BAX alternative routes

TABLE 5-1 POTENTIAL LAND-USE PLAN AMENDMENTS					
Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
Bureau of Land Management Grand Junction Field Office					
Grand Junction Resource Area Resource Management Plan and Record of Decision, 1987, as amended (BLM 1987a)	Yes	 GJFO1	5-11	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Garfield County Road 201 would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #244, and associated visual simulation.	All COUT BAX alternative routes
Colorado Canyons National Conservation Area					
Colorado Canyons National Conservation Area Resource Management Plan	No	Not applicable	5-12	None	Not applicable
National Park Service					
National Park Service Dinosaur National Monument: Dinosaur National Monument General Management Plan	To be decided	Not applicable	5-13	None	Not applicable
Utah					
Bureau of Land Management Salt Lake City Field Office					
Salt Lake District, Record of Decision for the Pony Express Resource Management Plan and Rangeland Program Summary for Utah County (BLM 1990)	Yes	 SLFO1	5-14	The alternative routes and route variations traverse small parcels of lands administered by the Salt Lake Field Office not located within a designated utility corridor. According to the Pony Express Resource Management Plan Record of Decision (page 56) “future proposals for major rights-of-way such as pipelines, large power lines, and permanent improved roads must use identified corridors. Otherwise, a planning amendment and appropriate environmental analysis will be required. Proposals that are not considered major may be sited outside corridors after demonstrating that locating within a corridor is not viable. In all cases, the utilization of ROW [right-of-way] in common shall be considered whenever possible.”	COUT-A, COUT-B, and COUT-C and route variations

TABLE 5-1 POTENTIAL LAND-USE PLAN AMENDMENTS					
Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
Bureau of Land Management Fillmore Field Office					
Richfield District House Range Resource Management Plan and Record of Decision Rangeland Program Summary (BLM 1987e)	No	Not applicable	5-15	None	Not applicable
Bureau of Land Management Price Field Office					
Price Field Office Record of Decision and Approved Resource Management Plan (BLM 2008d)	Yes	 PFO1	5-16	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the Dinosaur Diamond Scenic Byway (U.S. Highway 6) would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #41, and associated visual simulation.	COUT BAX-C and COUT BAX-E
	Yes	 PFO2	5-17	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the Wedge Overlook/Buckhorn Draw Scenic Backway would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #218.	COUT BAX-B and COUT BAX-C
	Yes	 PFO3	5-18	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the San Rafael Swell Destination Route (Green River Cutoff Road) would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #326.	COUT BAX-C
	Yes	 PFO4	5-19	Crosses Big Hole Rock Art Area of Critical Environmental Concern, an exclusion area for new utility corridors.	COUT BAX-B

**TABLE 5-1
POTENTIAL LAND-USE PLAN AMENDMENTS**

Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
Price Field Office Record of Decision and Approved Resource Management Plan (BLM 2008d)	Yes	 PFO5	5-20	New utility corridors in these areas will require a potential land-use plan amendment.	All COUT BAX-B alternative routes, COUT-C and Route Variations COUT-C-4 and COUT-C-5, COUT-H, and COUT-I
Bureau of Land Management Vernal Field Office					
Vernal Field Office Record of Decision and Approved Resource Management Plan (BLM 2008f)	Yes	 VFO1	5-21	New utilities must cross the Green River at Fourmile Bottom. The alternative route crosses in the designated area, which is also designated as VRM Class II. Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Green River at Fourmile Bottom would not be compliant with VRM Class II objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #203, and associated visual simulation. Crossing the Green River outside of the Fourmile Bottom area also would not be compliant with Lands and Realty Decision LAR-31 in the Approved RMP.	COUT-C and all route variations, COUT-H, and COUT-I
	Yes	 VFO2	5-22	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects resulting from the proximity of the Project to the Enron Recreation Area would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Worksheet, KOP #87, and associated visual simulation.	COUT-C and all route variations, COUT-H, and COUT-I
Vernal Field Office Record of Decision and Approved Resource Management Plan (BLM 2008f)	Yes	 VFO3	5-23	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Nine Mile Canyon Scenic Backway would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #273.	COUT-C and all route variations, COUT-H, and COUT-I

**TABLE 5-1
POTENTIAL LAND-USE PLAN AMENDMENTS**

Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
	Yes	 VFO4	5-24	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Argyle Canyon Road would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheets, KOP #200, and associated visual simulation.	COUT-C and all route variations, COUT-H, and COUT-I
	Yes	 VFO5	5-25	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the Reservation Ridge Scenic Backway would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #329.	COUT-B-1 and COUT-C-1
Bureau of Land Management Richfield Field Office					
Richfield Field Office, Record of Decision and Approved Resource Management Plan (BLM 2008e)	No	Not applicable	5-26	Not applicable	Not applicable
Bureau of Land Management Moab Field Office					
Moab Field Office Record of Decision and Approved Resource Management Plan (BLM 2008c)	Yes	 MFO1	5-27	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Old U.S. Highway 6 would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #245.	All COUT BAX alternative routes
Moab Field Office Record of Decision and Approved Resource Management Plan (BLM 2008c)	Yes	 MFO2	5-28	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects resulting from the proximity of the Project to the Harley Dome Rest Area (along Interstate 70 [I-70]) would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #152, and associated visual simulation.	All COUT BAX alternative routes

**TABLE 5-1
POTENTIAL LAND-USE PLAN AMENDMENTS**

Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
	Yes	 MFO3	5-29	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling I-70 would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, KOP #246.	All COUT BAX alternative routes
Manti-La Sal National Forest					
Manti-La Sal National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Service [USFS] 1986b)	Yes	 MLSNF1	5-30	Per a standard for the General Big-game Winter Range Management Unit (management emphasis is on general big-game winter range) in the 1986 Manti-La Sal National Forest states that activities must meet the Visual Quality Objective (VQO) except where habitat improvement activities occur. Due to the proximity of the Project to U.S. Highway 89 and residences in the Birdseye, Utah, area, the Project would not be subordinate to the characteristic landscape in these areas, which would be inconsistent with the definition of a partial retention VQO.	COUT-A, COUT-B, COUT-C and route variations
Ashley National Forest					
Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (USFS 1986a)	Yes	 ANF1	5-31	A forest-wide standard in the 1986 Ashley National Forest land and resource management plan (LRMP) states that the forest will manage visual resource according to the adopted VQO. Due to proximity to the Avintaquin Campground and paralleling the Reservation Ridge Scenic Backway, the Project would not be consistent with a retention VQO.	COUT-B-1 and COUT-C-1
Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (USFS 1986a)	Yes	 ANF2	5-32	A forest-wide standard in the 1986 Ashley National Forest LRMP states that the forest will manage visual resource according to the adopted VQO. Due to paralleling the Reservation Ridge Scenic Backway, the Project would not be consistent with a partial retention VQO.	COUT-B-1, COUT-B-2, COUT-B-4, COUT-C-1, COUT-C-2, and COUT-C-4

TABLE 5-1 POTENTIAL LAND-USE PLAN AMENDMENTS					
Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
Uinta-Wasatch-Cache National Forests					
Uinta National Forest, Record of Decision for the Final Environmental Impact Statement and Revised Land and Resource Management Plan, 2003, as amended (<u>USFS 2003</u>)	Yes	 UNF1	5-33	Due to being outside of the Uinta National Forest utility corridor where crossing the inventoried roadless area, the Project would not be consistent with the Uinta National Forest LRMP.	COUT-A-1

TABLE 5-2 BUREAU OF LAND MANAGEMENT RAWLINS FIELD OFFICE PLAN AMENDMENT RFO1			
Identification Number on Map 5-1a	RFO1		
Resource Management Plan	Record of Decision and Approved Rawlins Resource Management Plan (Bureau of Land Management 2008b)		
Could Decision Require Amendment?	Yes		
Nonconformance Issue	The alternative route is located within the Colorado Interstate Gas/Entegra/Wyoming Interstate Company pipeline corridor, which is designated for underground utilities only.		
Description of Potential Plan Amendment	Right-of-way decisions listed under Section 2.3.5, <i>Lands and Realty</i> in the approved resource management plan (page 2-18) would be amended as follows (<i>new text in bold italics</i>): “Utility/Transportation Systems 1. Areas with important resource values will be avoided where possible in planning for new facility placement (600,290 acres). If it becomes necessary for facilities (i.e., linear rights-of-way) to be placed within avoidance areas, effects will be intensively managed. Avoidance and exclusion areas are identified on Map 2-33b and Table 2-5. 2. <i>CIG [Colorado Interstate Gas]/Entrega/WIC [Wyoming Interstate Company] utility corridor: Conversion of the existing north-south, underground corridor to include aboveground utilities is designated west of the Sweetwater/Carbon County line. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible. All possible measures will be taken to avoid conflicts with other existing and proposed uses (utility and otherwise) within the designated corridor.</i>”		
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	WYCO-C (including route variations WYCO-C-1, WYCO-C-2, and C-3)	Links	
		W128	5.1 miles
		W27	20.5 miles
		W409	16.6 miles
Potential Environmental Effects			
Direct and Indirect Effects The direct and indirect effects on the resources attributed to amending the designation of the underground pipeline corridor to allow overhead utilities, such as the Project, would be the same as the direct and indirect effects of constructing, operating, and maintaining the Project described for Alternative WYCO-C in Chapter 3, since this amendment would allow the Project to be permitted along this route. Cumulative Effects By amending the land-use plan to convert the existing north-south, underground corridor to allow aboveground utilities, overhead and additional underground utilities would be accommodated within the corridor. If overhead utilities are developed, such as the Project, the TransWest Express Project, or other future extra-high voltage transmission lines, they would likely result in cumulative effects on resources similar to cumulative effects from this Project discussed in Chapter 4.			

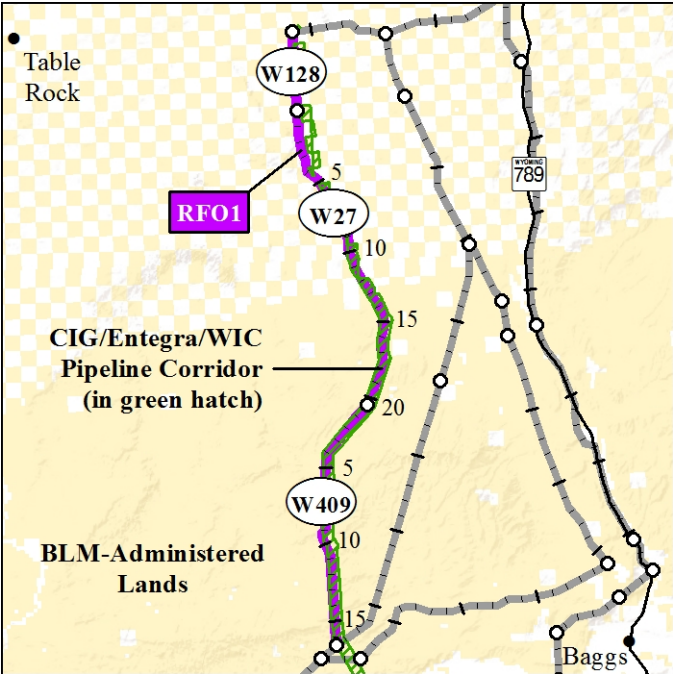
TABLE 5-2 BUREAU OF LAND MANAGEMENT RAWLINS FIELD OFFICE PLAN AMENDMENT RFO1	
Identification Number on Map 5-1a	RFO1
Resource Management Plan	Record of Decision and Approved Rawlins Resource Management Plan (Bureau of Land Management 2008b)
Conversion of the existing north-south, underground corridor to allow aboveground utilities could require existing and future pipelines to install cathodic protection if it is currently not in place. Currently, the pipelines located in the underground corridor have modified existing vegetation forms through the development of a geometrically cleared right-of-way. By amending the right-of-way decision to allow overhead utilities, transmission structures could be constructed with associated geometric right-of-way vegetation clearing and construction access roads for future transmission projects, which would further modify the landscape character and views in this area.	 The map shows a section of land with a yellow and white checkerboard pattern. A green hatched area, labeled 'CIG/Entegra/WIC Pipeline Corridor (in green hatch)', runs vertically. To the left of this corridor is a label 'BLM-Administered Lands'. To the right, a road labeled '789' runs vertically. Several points are marked along the corridor with labels: 'W128', 'W27', 'W409', and 'Baggs'. A purple box labeled 'RFO1' is located near the top of the corridor. A black dot labeled 'Table Rock' is in the upper left corner. The corridor is divided into segments with numbers: 5, 10, 15, 20, 5, 10, 15.

TABLE 5-3 BUREAU OF LAND MANAGEMENT RAWLINS FIELD OFFICE PLAN AMENDMENT RFO2	
Identification Number on Map 5-1a	RFO2
Resource Management Plan	Record of Decision and Approved Rawlins Resource Management Plan (Bureau of Land Management [BLM] 2008b)
Could Decision Require Amendment?	Yes
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Cherokee Historic Trail in these areas would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Sheet Worksheet, Key Observation Point #276.
Description of Potential Plan Amendment	The relevant goal, management objectives, and management actions for visual resource management (2-48) in the Rawlins Resource Management Plan (RMP) currently state: “Goal – Manage public lands according to VRM classes that are determined based on land use allocation decisions made in this RMP. Management Objectives: • Establish VRM Classes for the RMPPA. • Maintain the overall integrity of visual resource classes while allowing for development of existing and future uses Management Actions • Manage visual resources to meet the Wyoming Standards for Healthy Rangelands. • VRM classes are designated as shown on Map 2-50 (Table 2-9 and Appendix 25).” The following text will be added to amend the second management action (<i>new text in bold italics; note: each amendment is associated with a specific transmission line alternative route</i>): <u>WYCO-B</u> <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link W113 from Milepost 18.0 to 18.7 and Link W410 from Milepost 0.0 to 0.3 of the Project (approximately 1.0 mile) would be amended to VRM Class IV (a total of 31 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> <u>WYCO-C</u> <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link W409 from Milepost 15.7 to 16.6 and Link W410 from Milepost 0.0 to 0.3 of the Project (approximately 1.2 miles) would be amended to VRM Class IV (a total of 36 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i>

TABLE 5-3 BUREAU OF LAND MANAGEMENT RAWLINS FIELD OFFICE PLAN AMENDMENT RFO2		
Identification Number on Map 5-1a	RFO2	
Resource Management Plan	Record of Decision and Approved Rawlins Resource Management Plan (Bureau of Land Management [BLM] 2008b)	
Description of Potential Plan Amendment	WYCO-F and all route variations <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link W124 from Mileposts 12.7 to 13.8 and 16.1 to 17.6 of the Project (approximately 2.6 miles) would be amended to VRM Class IV (a total of 81 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Rawlins RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	WYCO-B and all route variations	<u>Links</u> W113 0.7 mile W410 0.3 mile
	WYCO-C and all route variations	<u>Links</u> W409 0.9 mile W410 0.3 mile
	WYCO-F and all route variations	<u>Links</u> W124 2.6 miles
Potential Environmental Effects		
The following components of the Rawlins Field Office Visual Resource Inventory (VRI) are located within the planning area boundary: <u>WYCO-B:</u> Scenic Quality Rating Units: 31 acres of Class B lands Sensitivity Level Rating Units: 31 acres of high sensitivity lands Distance Zones: 31 acres in the foreground-middleground distance zone VRI Class: 31 acres of VRI Class II lands <u>WYCO-C:</u> Scenic Quality Rating Units: 36 acres of Class B lands Sensitivity Level Rating Units: 36 acres of high sensitivity lands Distance Zones: 36 acres in the foreground-middleground distance zone VRI Class: 36 acres of VRI Class II lands <u>WYCO-F:</u> Scenic Quality Rating Units: 47 acres of Class B and 34 acres of Class C lands Sensitivity Level Rating Units: 47 acres of high sensitivity and 34 acres of moderate sensitivity lands Distance Zones: 81 acres in the foreground-middleground distance zone VRI Class: 47 acres of VRI Class II and 34 acres of VRI Class IV lands		

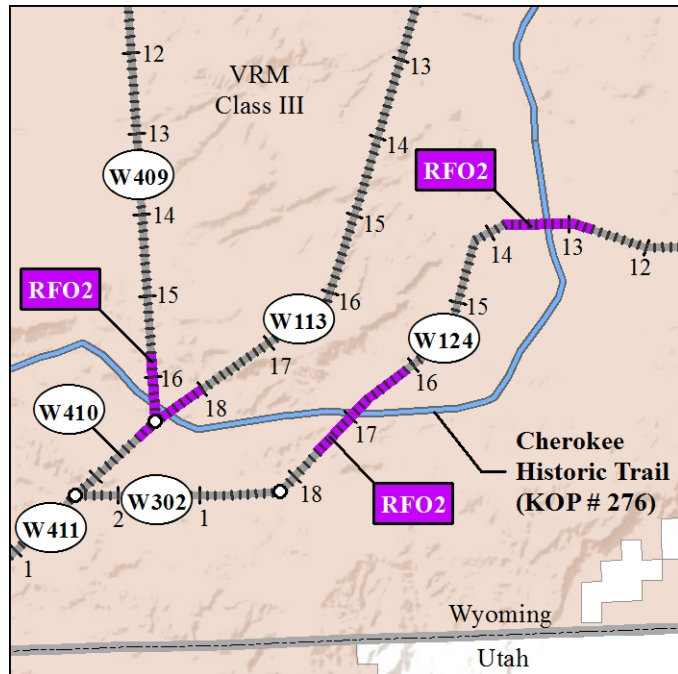


TABLE 5-3 BUREAU OF LAND MANAGEMENT RAWLINS FIELD OFFICE PLAN AMENDMENT RFO2	
Identification Number on Map 5-1a	RFO2
Resource Management Plan	Record of Decision and Approved Rawlins Resource Management Plan (Bureau of Land Management [BLM] 2008b)
Amendment of the land-use plan would result in the following changes to the overall Rawlins Field Office VRM objectives: <u>WYCO-B</u>: 31 fewer acres of VRM Class III (currently 2,336,836 acres) and 31 more acres of VRM Class IV (currently 828,014 acres) <u>WYCO-C</u>: 36 fewer acres of VRM Class III (currently 2,336,836 acres) and 36 more acres of VRM Class IV (currently 828,014 acres) <u>WYCO-F</u>: 81 fewer acres of VRM Class III (currently 2,336,836 acres) and 81 more acres of VRM Class IV (currently 828,014 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 31, 36, or 81 acres (depending on the selected alternative route) adjacent to the Cherokee Historic Trail were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project. Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Rawlins RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-4 BUREAU OF LAND MANAGEMENT LITTLE SNAKE FIELD OFFICE PLAN AMENDMENT LSFO1		
Identification Number on Map 5-1a	LSFO1	
Resource Management Plan	Little Snake Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2011b)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Godiva Rim Proposed Backcountry Byway would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #289.	
Description of Potential Plan Amendment	The relevant goal and objectives for visual resource management (RMP-34) in the Little Snake RMP currently state: “Goal - Recognize and manage visual resources for overall multiple use and quality of life for local communities and visitors to public lands. Objectives for achieving these goals include: • Maintain visual characteristics/values as designated by management classes. • Ensure land management projects and uses meet VRM objectives within the boundaries of the designated VRM management class.” Additionally, management actions list the areas by VRM Class to be managed according to those objectives. The following text will be added to amend the list of Class IV locations (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link C91 from Milepost 3.9 to 4.6 of the Project (approximately 0.7 mile) would be amended to VRM Class IV (a total of 22 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Little Snake RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	WYCO-B, WYCO-C, and WYCO-F and all route variations	<u>Link</u> C91 0.7 mile

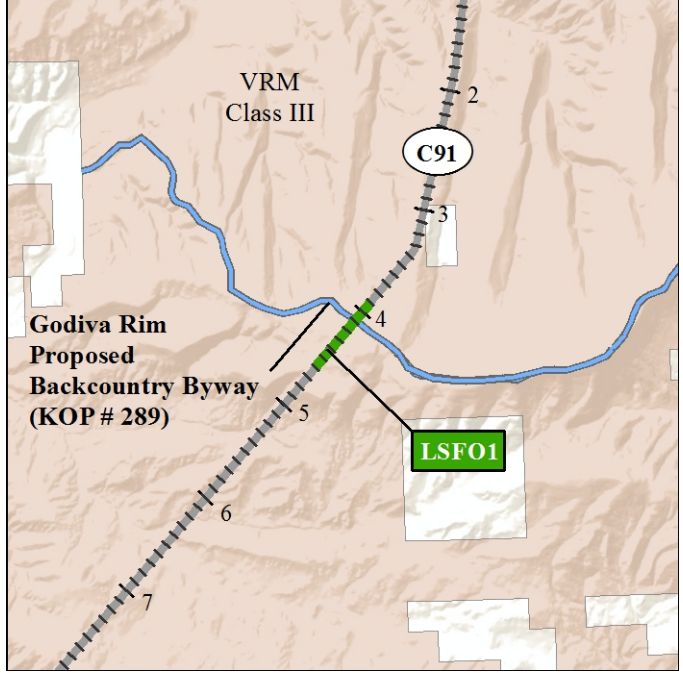
TABLE 5-4 BUREAU OF LAND MANAGEMENT LITTLE SNAKE FIELD OFFICE PLAN AMENDMENT LSFO1	
Identification Number on Map 5-1a	LSFO1
Resource Management Plan	Little Snake Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2011b)
Potential Environmental Effects	
The following components of the Little Snake Field Office Visual Resource Inventory (VRI) are located within the planning area boundary: <u>Scenic Quality Rating Units</u>: 22 acres of Class B lands <u>Sensitivity Level Rating Units</u>: 22 acres of high sensitivity lands <u>Distance Zones</u>: 22 acres in the foreground-middleground distance zone <u>VRI Class</u>: 22 acres of VRI Class II lands Amendment of the land-use plan would result in the following changes to the overall Little Snake Field Office VRM objectives: <u>WYCO-B</u>: 22 fewer acres of VRM Class III (currently 929,270 acres) and 22 more acres of VRM Class IV (currently 178,590 acres) <u>WYCO-C</u>: 22 fewer acres of VRM Class III (currently 929,270 acres) and 22 more acres of VRM Class IV (currently 178,590 acres) <u>WYCO-F</u>: 22 fewer acres of VRM Class III (currently 929,270 acres) and 22 more acres of VRM Class IV (currently 178,590 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 22 acres adjacent to the Godiva Rim Proposed Backcountry Byway were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project. Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures.	
	

TABLE 5-4 BUREAU OF LAND MANAGEMENT LITTLE SNAKE FIELD OFFICE PLAN AMENDMENT LSFO1	
Identification Number on Map 5-1a	 LSFO1
Resource Management Plan	Little Snake Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2011b)
By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Little Snake RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-5 BUREAU OF LAND MANAGEMENT LITTLE SNAKE FIELD OFFICE PLAN AMENDMENT LSFO2		
Identification Number on Map 5-1a	LSFO2	
Resource Management Plan	Little Snake Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2011b)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Colorado State Highway 13 would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #66, and associated visual simulation.	
Description of Potential Plan Amendment	The relevant goal and objectives for visual resource management (RMP-34) in the Little Snake RMP currently state: “Goal - Recognize and manage visual resources for overall multiple use and quality of life for local communities and visitors to public lands. Objectives for achieving these goals include: • Maintain visual characteristics/values as designated by management classes. • Ensure land management projects and uses meet VRM objectives within the boundaries of the designated VRM management class.” Additionally, management actions list areas by VRM Class to be managed according to those objectives. The following text will be added to amend the list of Class IV locations (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link C13 from Mileposts 0.0 to 4.2, 8.4 to 10.9, 13.9 to 14.9, and 16.5 to 17.0 of the Project (approximately 8.2 miles) would be amended to VRM Class IV (a total of 246 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Little Snake RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	WYCO-D and route variation	Link C13 8.2 miles

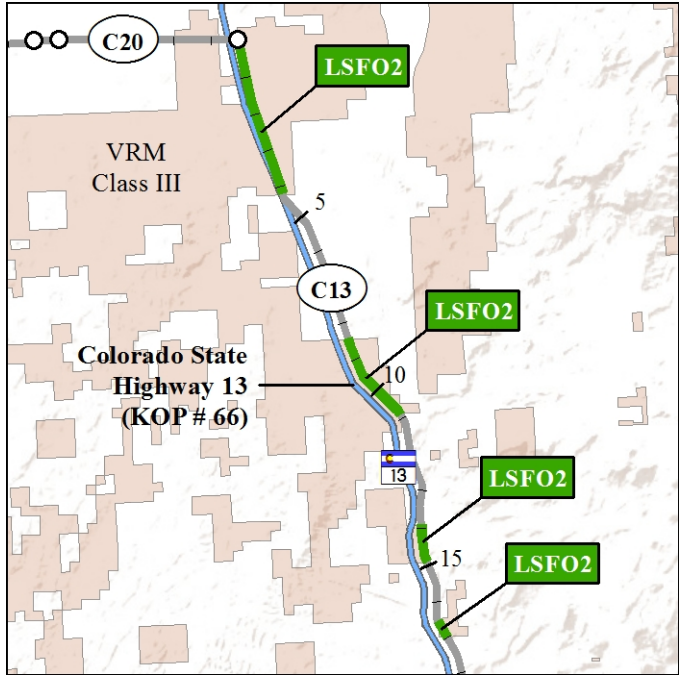
TABLE 5-5 BUREAU OF LAND MANAGEMENT LITTLE SNAKE FIELD OFFICE PLAN AMENDMENT LSFO2	
Identification Number on Map 5-1a	LSFO2
Resource Management Plan	Little Snake Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2011b)
Potential Environmental Effects	
The following components of the Little Snake Field Office Visual Resource Inventory (VRI) are located within the planning area boundary: <u>Scenic Quality Rating Units</u>: 44 acres of Class B and 202 acres of Class C lands <u>Sensitivity Level Rating Units</u>: 59 acres of moderate and 187 acres of low sensitivity lands <u>Distance Zones</u>: 246 acres in the foreground-middleground distance zone <u>VRI Class</u>: 44 acres of VRI Class III and 202 acres of VRI Class IV lands. Amendment of the land-use plan would result in the following changes to the overall Little Snake Field Office VRM objectives: <u>WYCO-D</u>: 246 fewer acres of VRM Class III (currently 929,270 acres) and 246 more acres of VRM Class IV (currently 178,590 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 246 acres adjacent to Colorado State Highway 13 were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project. Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future,	

TABLE 5-5 BUREAU OF LAND MANAGEMENT LITTLE SNAKE FIELD OFFICE PLAN AMENDMENT LSFO2	
Identification Number on Map 5-1a	 LSFO2
Resource Management Plan	Little Snake Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2011b)
associated with other RFFAs, the Little Snake RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-6 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO1		
Identification Number on Map 5-1b	WRFO1	
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 1997, as amended (Bureau of Land Management 1997)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	All suitable habitat for listed and candidate plant species are exclusion areas for new rights-of-way authorizations.	
Description of Potential Plan Amendment	Decisions regarding right-of-way exclusion areas for listed plant species in Chapter 2 (page 2-17), Resource Decisions, of the Approved Resource Management Plan would be amended as follows (<i>new text in bold italics</i>): “All known and potential [suitable] for listed and candidate plant species, including Areas of Critical Environmental Concern, are exclusion areas for new rights-of-way authorizations. <i>Portions of the Energy Gateway South Transmission Project may overlap with habitat for listed plant species. If, after application of all feasible mitigation measures to reduce impacts on special status plant habitat (including spanning habitats and approving narrower rights-of-way), the Project would still occur within identified habitat, an exception could be granted by the Field Manager in those areas if it was determined, in consultation with the U.S. Fish and Wildlife Service, that the construction, operation, and maintenance of the Energy Gateway South Transmission Project would not preclude the survival and recovery of the species. The Raven Ridge Area of Critical Environmental Concern would remain an exclusion area and the Energy Gateway South Transmission Project would not be permitted within this area.</i>”	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	Unknown	Unknown
Potential Environmental Effects		
Surveys for all special status species would be conducted along the selected route prior to construction activities. Potential [suitable] habitat for listed and candidate plant species or populations identified in the White River Field Office would be avoided to the extent possible and any additional mitigation measures would be incorporated into the Plan of Development.		
Map insert cannot be provided as locations where suitable habitat for listed and candidate plants could occur would be determined during surveys along the selected alternative route.		

TABLE 5-7 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO2		
Identification Number on Map 5-1b	 WRFO2	
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 1997, as amended (Bureau of Land Management [BLM] 1997)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Dinosaur Diamond Scenic Byway in Canyon Pintado would not be compliant with Visual Resource Management (VRM) Class III objectives established in the Resource Management Plan (RMP) for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #241 and associated visual simulation.	
Description of Potential Plan Amendment	Decisions regarding consistency with VRM classification objectives in Chapter 2 (page 2-39), Resource Decisions, of the Approved Resource Management Plan currently states: Proposed management action and projects will be evaluated for consistency with VRM classification objectives. Management actions and projects that would noticeably change the characteristic of the more sensitive landscapes would be modified to blend in with the landscape, denied, or moved to another more suitable location. The following text will be added to amend the RMP (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link C185 from Milepost 7.2 to 8.3 of the Project (approximately 1.1 miles) would be amended to VRM Class IV (a total of 34 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the White River RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT BAX-B; COUT BAX-C; and COUT BAX-E	<u>Link</u> C185 1.1 mile

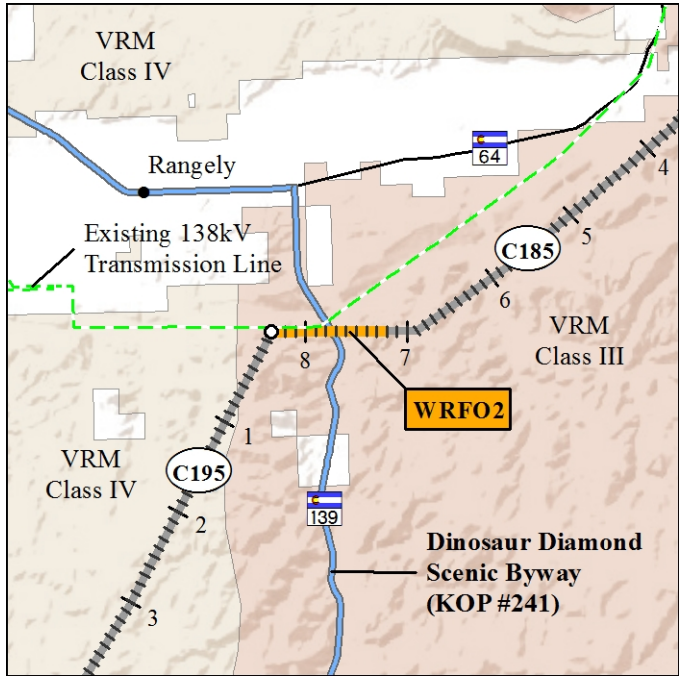
TABLE 5-7 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO2	
Identification Number on Map 5-1b	WRFO2
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 1997, as amended (Bureau of Land Management [BLM] 1997)
Potential Environmental Effects	
The following components of the White River Field Office Visual Resource Inventory (VRI) are located within the planning area boundary : <u>Scenic Quality Rating Units</u>: 34 acres of Class B lands <u>Sensitivity Level Rating Units</u>: 34 acres of high sensitivity lands <u>Distance Zones</u>: 34 acres in the foreground-middleground distance zone <u>VRI Class</u>: 34 acres of VRI Class II lands Amendment of the land-use plan would result in the following changes to the overall White River Field Office VRM objectives: <u>COUT BAX-B</u>: 34 less acres of VRM Class III (currently 861,680 acres) and 34 more acres of VRM Class IV (currently 146,100 acres) <u>COUT BAX-C</u>: 34 less acres of VRM Class III (currently 861,680 acres) and 34 more acres of VRM Class IV (currently 146,100 acres) <u>COUT BAX-E</u>: 34 less acres of VRM Class III (currently 861,680 acres) and 34 more acres of VRM Class IV (currently 146,100 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 34 acres adjacent to the Dinosaur Diamond Scenic Byway (Colorado State Highway 139) were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.	

TABLE 5-7 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO2	
Identification Number on Map 5-1b	 WRFO2
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 1997, as amended (Bureau of Land Management [BLM] 1997)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the White River RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-8 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO3		
Identification Number on Map 5-1b	 WRFO3	
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 1997, as amended (Bureau of Land Management [BLM] 1997)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Baxter Pass Road would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #244, and associated visual simulation.	
Description of Potential Plan Amendment	Decisions regarding consistency with VRM classification objectives in Chapter 2 (page 2-39), Resource Decisions, of the Approved Resource Management Plan currently states: Proposed management action and projects will be evaluated for consistency with VRM classification objectives. Management actions and projects that would noticeably change the characteristic of the more sensitive landscapes would be modified to blend in with the landscape, denied, or moved to another more suitable location. The following text will be added to amend the RMP (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link C196 from Mileposts 1.2 to 1.4 and 2.0 to 6.4 of the Project (approximately 4.6 miles) would be amended to VRM Class IV (a total of 142 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the White River RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Link C196 4.6 miles

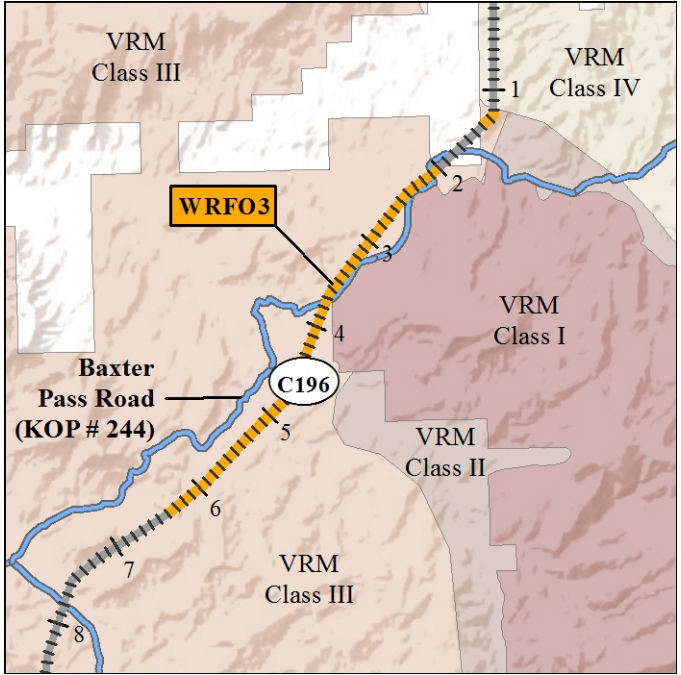
TABLE 5-8 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO3	
Identification Number on Map 5-1b	 WRFO3
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 1997, as amended (Bureau of Land Management [BLM] 1997)
Potential Environmental Effects	
The following components of the White River Field Office Visual Resource Inventory (VRI) are located within the planning area boundary: <u>Scenic Quality Rating Units</u>: 142 acres of Class B lands <u>Sensitivity Level Rating Units</u>: 142 acres of high sensitivity lands <u>Distance Zones</u>: 129 acres in the background and 13 acres in the seldom seen distance zones <u>VRI Class</u>: 142 acres of VRI Class III lands Amendment of the land-use plan would result in the following changes to the overall White River Field Office VRM objectives: <u>COUT BAX-B</u>: 142 less acres of VRM Class III (currently 861,680 acres) and 142 more acres of VRM Class IV (currently 146,100 acres) <u>COUT BAX-C</u>: 142 less acres of VRM Class III (currently 861,680 acres) and 142 more acres of VRM Class IV (currently 146,100 acres) <u>COUT BAX-E</u>: 142 less acres of VRM Class III (currently 861,680 acres) and 142 more acres of VRM Class IV (currently 146,100 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 142 acres adjacent to Baxter Pass Road were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.	

TABLE 5-8 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO3	
Identification Number on Map 5-1b	 WRFO3
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 1997, as amended (Bureau of Land Management [BLM] 1997)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the White River RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-9 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO4		
Identification Number on Map 5-1b	WRFO4	
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 1997, as amended (BLM 1997)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, visual effects resulting from the proximity of the Project to a residence in Whiskey Creek would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #242.	
Description of Potential Plan Amendment	Decisions regarding consistency with VRM classification objectives in Chapter 2 (page 2-39), Resource Decisions, of the Approved Resource Management Plan currently states: Proposed management action and projects will be evaluated for consistency with VRM classification objectives. Management actions and projects that would noticeably change the characteristic of the more sensitive landscapes would be modified to blend in with the landscape, denied, or moved to another more suitable location. The following text will be added to amend the RMP (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link C196 from Milepost 10.8 to 11.1 of the Project (approximately 0.3 mile) would be amended to VRM Class IV (a total of 8 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the White River RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Link C196 0.3 mile

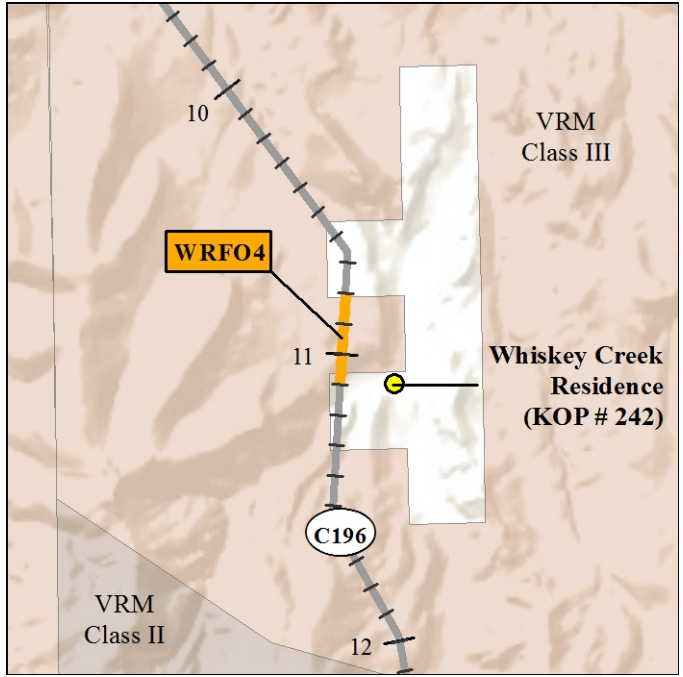
TABLE 5-9 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO4	
Identification Number on Map 5-1b	WRFO4
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 1997, as amended (BLM 1997)
Potential Environmental Effects	
The following components of the White River Field Office Visual Resource Inventory (VRI) are located within the planning area boundary: <u>Scenic Quality Rating Units</u>: 8 acres of Class B lands <u>Sensitivity Level Rating Units</u>: 8 acres of moderate sensitivity lands <u>Distance Zones</u>: 8 acres in the seldom seen distance zone <u>VRI Class</u>: 8 acres of VRI Class IV lands Amendment of the land-use plan would result in the following changes to the overall White River Field Office VRM objectives: <u>COUT BAX-B</u>: 8 less acres of VRM Class III (currently 861,680 acres) and 8 more acres of VRM Class IV (currently 146,100 acres) <u>COUT BAX-C</u>: 8 less acres of VRM Class III (currently 861,680 acres) and 8 more acres of VRM Class IV (currently 146,100 acres) <u>COUT BAX-E</u>: 8 less acres of VRM Class III (currently 861,680 acres) and 8 more acres of VRM Class IV (currently 146,100 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 8 acres adjacent to a residence in Whiskey Creek were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.	
	

TABLE 5-9 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO4	
Identification Number on Map 5-1b	 WRFO4
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 1997, as amended (BLM 1997)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the White River RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

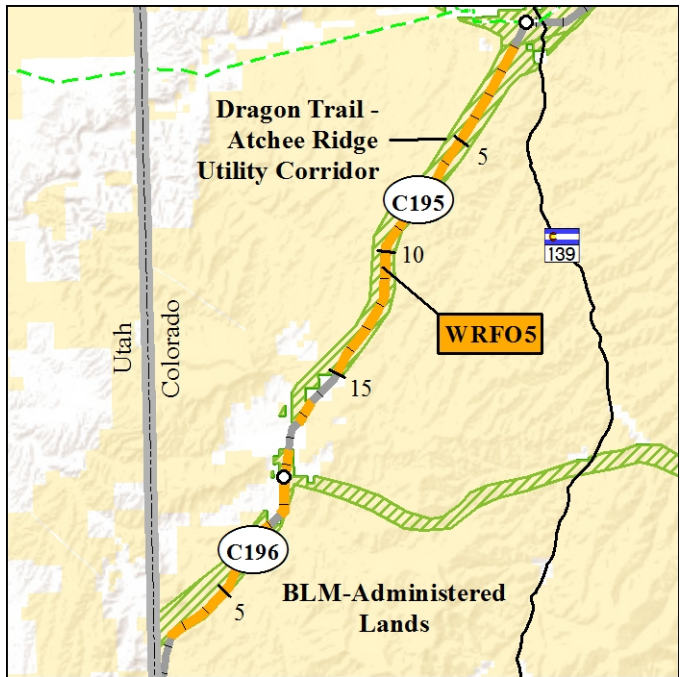
TABLE 5-10 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO5			
Identification Number on Map 5-1b	WRFO5		
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 1997, as amended 2009 (Bureau of Land Management 1997)		
Could Decision Require Amendment?	Yes		
Nonconformance Issue	The alternative routes follow the Dragon Trail-Atchee Ridge utility corridor, which is designated for underground utilities only.		
Description of Potential Plan Amendment	Right-of-way decisions listed in decisions in the White River Resource Management Plan (p. 2-51) would be amended as follows (<i>new text in bold italics</i>): “DRAGON TRAIL-ATCHEE RIDGE: This corridor follows the route once proposed as the Rangely Loop segment of the Northwest Pipeline Expansion Project. It runs south from Rangely, to the vicinity of Baxter Pass, is approximately 1-mile wide, and will accommodate all buried <i>and overhead</i> linear facilities.”		
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Links	
		C195	16.0 miles
		C196	7.1 miles
Potential Environmental Effects			
Direct and Indirect Effects The direct and indirect effects on the resources attributed to amending the designation of the pipeline corridor to allow overhead utilities, such as the Project, would be the same as the direct and indirect effects of constructing, operating, and maintaining the Project described for Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E in Chapter 3, since this amendment would allow the Project to be permitted on this route. Cumulative Effects By amending the land-use plan to convert the existing underground corridor to allow aboveground utilities, overhead and additional underground utilities could be accommodated within the corridor. If overhead utilities are developed, such as the Project, the TransWest Express Project, or other future extra-high voltage transmission lines, they would likely result in cumulative effects on resources similar to cumulative effects from this Project discussed in Chapter 4. Conversion of the existing north-south, underground corridor to allow aboveground utilities could require existing and future pipelines to install cathodic protection if it is currently not in place. Currently, the pipelines located in the underground corridor have modified existing vegetation forms through the development of a geometrically, cleared right-of-way. By amending the right-of-way decision to allow overhead utilities, transmission structures could be constructed, with associated geometric right-of-way vegetation clearing and construction access roads, for future transmission projects which would further modify the landscape character and views in this area.			
			

TABLE 5-11 BUREAU OF LAND MANAGEMENT GRAND JUNCTION FIELD OFFICE PLAN AMENDMENT GJFO1		
Identification Number on Map 5-1b	GJFO1	
Resource Management Plan	Grand Junction Resource Area Resource Management Plan and Record of Decision, 1987, as amended (Bureau of Land Management [BLM] 1987a)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Garfield County Road 201 would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #244, and associated visual simulation.	
Description of Potential Plan Amendment	The relevant objectives and planned management actions for visual resource management (2-21) in the Grand Junction RMP currently state: “Objective – To protect the quality of the scenic values on public land where visual resource management is an issue or where high value visual resources exist, and to protect areas having high scenic quality, visual sensitivity, and public visibility. Planned management actions: • Adopt the visual resource management classes as listed in Table 15 and shown on Map 15. Modify, relocate, mitigate, or deny proposed projects that conflict with the objectives of these classes.” The following text will be added to the VRM Rationale as well as amend the VRM classes listed in Table 15 (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link C197 from Mileposts 2.4 to 2.5, 2.7 to 4.1, 4.5 to 4.7, 4.9 to 5.3, 6.3 to 6.6, 8.3 to 8.5, 9.0 to 9.1, and 11.1 to 14.6 of the Project (approximately 6.2 miles) would be amended to VRM Class IV (a total of 184 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Grand Junction RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Link C197 6.2 miles

TABLE 5-11 BUREAU OF LAND MANAGEMENT GRAND JUNCTION FIELD OFFICE PLAN AMENDMENT GJFO1	
Identification Number on Map 5-1b	 GJFO1
Resource Management Plan	Grand Junction Resource Area Resource Management Plan and Record of Decision, 1987, as amended (Bureau of Land Management [BLM] 1987a)
Potential Environmental Effects	
The following components of the Grand Junction Field Office Visual Resource Inventory (VRI) are located within the planning area boundary <u>Scenic Quality Rating Units</u>: 141 acres of Class B and 43 acres of Class C lands <u>Sensitivity Level Rating Units</u>: 100 acres of high, 41 acres of moderate, and 43 acres of low sensitivity lands <u>Distance Zones</u>: 186 acres in the foreground-middleground distance zone <u>VRI Class</u>: 100 acres of VRI Class II, 41 acres of VRI Class III, and 43 acres of VRI Class IV lands Amendment of the land-use plan would result in the following changes to the overall Grand Junction Field Office VRM objectives: <u>COUT BAX-B</u>: 184 fewer acres of VRM Class III (currently 180,481 acres) and 184 more acres of VRM Class IV (currently 838,499 acres) <u>COUT BAX-C</u>: 184 fewer acres of VRM Class III (currently 180,481 acres) and 184 more acres of VRM Class IV (currently 838,499 acres) <u>COUT BAX-E</u>: 184 fewer acres of VRM Class III (currently 180,481 acres) and 184 more acres of VRM Class IV (currently 838,499 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 184 acres adjacent to Garfield County Road 201 were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.	

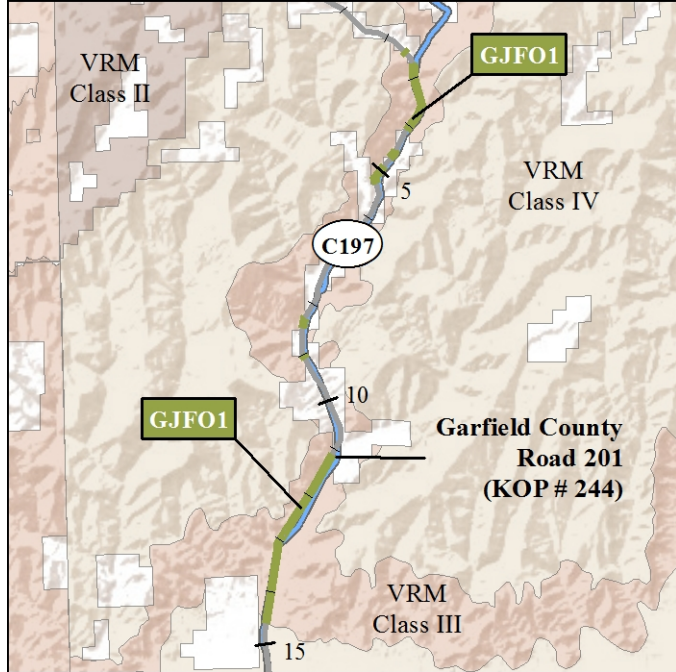


TABLE 5-11 BUREAU OF LAND MANAGEMENT GRAND JUNCTION FIELD OFFICE PLAN AMENDMENT GJFO1	
Identification Number on Map 5-1b	 GJFO1
Resource Management Plan	Grand Junction Resource Area Resource Management Plan and Record of Decision, 1987, as amended (Bureau of Land Management [BLM] 1987a)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Grand Junction RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-12 COLORADO CANYONS NATIONAL CONSERVATION AREA PLAN AMENDMENT		
Identification Number on Map 5-1b	Not applicable	
Resource Management Plan	Colorado Canyons National Conservation Area Resource Management Plan	
Could Decision Require Amendment?	No	
Nonconformance Issue	None	
Description of Potential Plan Amendment	None	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	Not applicable	Not applicable
Potential Environmental Effects		
Not applicable		

TABLE 5-13 NATIONAL PARK SERVICE PLAN AMENDMENT		
Identification Number on Map 5-1b	Not applicable	
Resource Management Plan	National Park Service Dinosaur National Monument: Dinosaur National Monument General Management Plan	
Could Decision Require Amendment?	To be decided	
Nonconformance Issue	None	
Description of Potential Plan Amendment	None	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	Not applicable	Not applicable
Potential Environmental Effects		
Not applicable		

TABLE 5-14 BUREAU OF LAND MANAGEMENT SALT LAKE CITY FIELD OFFICE PLAN AMENDMENT SLFO1		
Identification Number on Map 5-1b	SLFO1	
Resource Management Plan	Salt Lake District, Record of Decision for the Pony Express Resource Management Plan and Rangeland Program Summary for Utah County (Bureau of Land Management 1990)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	The alternative routes and route variations traverse small parcels of lands administered by the Salt Lake Field Office not located within a designated utility corridor. According to the Pony Express Resource Management Plan Record of Decision (page 56) “future proposals for major rights-of-way such as pipelines, large power lines, and permanent improved roads must use identified corridors. Otherwise, a planning amendment and appropriate environmental analysis will be required. Proposals that are not considered major may be sited outside corridors after demonstrating that locating within a corridor is not viable. In all cases, the utilization of ROW [right-of-way] in common shall be considered whenever possible.”	
Description of Potential Plan Amendment	For Alternatives COUT-B and COUT-C, the utility corridor decisions in the Pony Express Resource Management Plan Record of Decision page 56, Figure 10) would be amended to include the Project right-of-way as a utility corridor.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-A, COUT-A-1, COUT-B, and COUT-C	Links U460 0.2 mile U621 0.1 mile
	COUT-B-1, COUT-B-2, COUT-B-4, COUT-C-1, COUT-C-2, and COUT-C-4	Link U515 3.4 miles
	COUT-B-3, COUT-B-5, COUT-C-3, and COUT-C-5	Link U516 3.0 miles

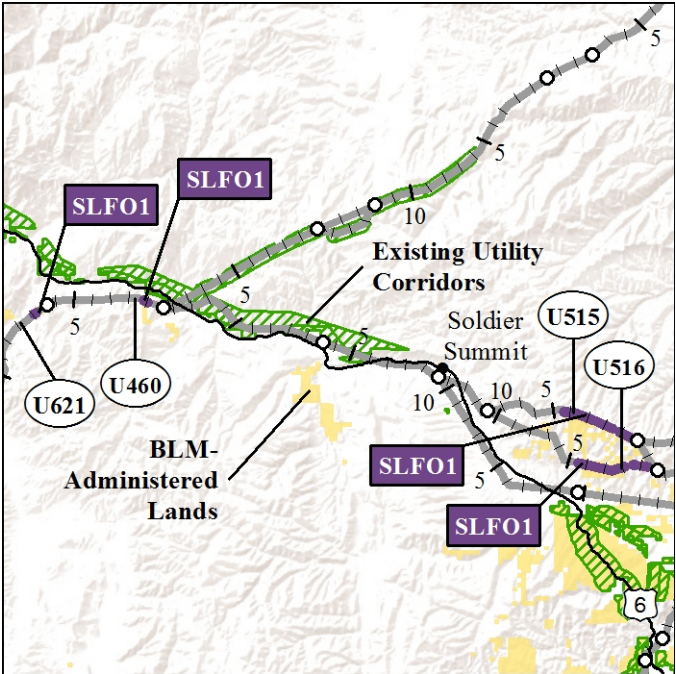
TABLE 5-14 BUREAU OF LAND MANAGEMENT SALT LAKE CITY FIELD OFFICE PLAN AMENDMENT SLFO1	
Identification Number on Map 5-1b	SLFO1
Resource Management Plan	Salt Lake District, Record of Decision for the Pony Express Resource Management Plan and Rangeland Program Summary for Utah County (Bureau of Land Management 1990)
Potential Environmental Effects	
Direct and Indirect Effects The direct and indirect effects on the resources attributed to amending the utility corridor width would be the same as the direct and indirect effects of constructing, operating, and maintaining the Project described for Alternatives COUT-A and route variations, COUT-B and route variations, COUT-C and route variations in Chapter 3, since this amendment would allow the Project to be permitted on this route.	 A topographic map of a region in Utah. It shows several utility corridors marked with green hatched lines and labeled 'SLFO1' in purple boxes. There are also labels for 'Existing Utility Corridors' and 'BLM-Administered Lands' in yellow. Specific landmarks and routes are marked with circles and labels: 'U621', 'U460', 'U515', 'U516', and 'Soldier Summit'. Distances of 5 and 10 are indicated along some of the corridors. A road labeled '6' is visible in the bottom right corner.
Cumulative Effects Including the Project right-of-way as a utility corridor could allow additional utilities to be located within the corridor. If additional utilities are developed, such as the TransWest Express Project or other future extra-high voltage transmission lines, they would likely result in cumulative effects on resources similar to cumulative effects from this Project discussed in Chapter 4.	
Including the Project right-of-way as a utility corridor could allow increased access into an area previously closed to vehicular traffic.	
Including the Project right-of-way as a utility corridor could create a siting opportunity for future projects as this area would become more dominated by transmission lines, such as the TransWest Express Project or other future extra-high voltage transmission lines if additional exceptions were granted. The addition of these potential projects has the potential to further impact visual values from viewing locations through additional structures, vegetation management activities, and access roads in this area.	

TABLE 5-15 BUREAU OF LAND MANAGEMENT FILLMORE FIELD OFFICE PLAN AMENDMENT	
Identification Number on Map 5-1b	Not applicable
Resource Management Plan	Richfield District House Range Resource Management Plan and Record of Decision Rangeland Program Summary (Bureau of Land Management 1987e)
Could Decision Require Amendment?	No
Nonconformance Issue	Not applicable
Description of Potential Plan Amendment	None
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	Not applicable
Potential Environmental Effects	
Not applicable	

TABLE 5-16 BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO1	
Identification Number on Map 5-1b	 PFO1
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)
Could Decision Require Amendment?	Yes
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the Dinosaur Diamond Scenic Byway (U.S. Highway 6) would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #41, and associated visual simulation.
Description of Potential Plan Amendment	The relevant goals and objectives for visual resource management (page 77) in the Price RMP currently state: “Goals: • Identify scenic resources, integral landscapes, and vistas that contribute to the sense of place and quality of life of visitors and residents. Assign VRM classes to all landscapes. • Manage scenic resources, integral vistas, and landscapes for the benefit of local residents and visitors. • Identify acceptable levels of manmade contrast on area landscapes. Objectives: • Over the life of the plan management actions will be conducted in a manner that protects scenic values and landscapes through the use of the Visual Management System. • Use proper design techniques and mitigation measures, future projects and use authorizations under this plan to minimize contrast with the characteristic landscape and not exceed the VRM Management Class Standards.” Additionally, specific management decisions are listed stating the VRM Class associated with different planning decisions. The following text will be added to amend the list of management decisions (<i>new text in bold italics, please note each amendment is associated with a particular Project alternative route</i>): <u>COUT BAX-C</u> <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link U488 from Milepost 12.0 to 15.1 of the Project (approximately 3.1 miles) would be amended to VRM Class IV (a total of 95 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> <u>COUT BAX-E</u> <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link U488 from Milepost 12.0 to 15.1 and Link U489 from Mileposts 0.0 to</i>

TABLE 5-16 BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO1			
Identification Number on Map 5-1b	PFO1		
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)		
	4.2 and 4.3 to 4.5 of the Project (approximately 7.5 miles) would be amended to VRM Class IV (a total of 229 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.” Amendment of this decision in the Price RMP would facilitate accommodation of the Project with revised plan VRM objectives.		
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT BAX-C	Link U488	3.1 miles
	COUT BAX-E	Links U488	3.1 miles
		U489	4.4 miles
Potential Environmental Effects			
The following components of the Price Field Office Visual Resource Inventory (VRI) are located within the planning area boundary : <u>COUT BAX-C:</u> Scenic Quality Rating Units: 95 acres of Class C lands Sensitivity Level Rating Units: 95 acres of moderate sensitivity lands Distance Zones: 95 acres in the foreground-middleground distance zone VRI Class: 95 acres of VRI Class IV lands <u>COUT BAX-E:</u> Scenic Quality Rating Units: 229 acres of Class C lands Sensitivity Level Rating Units: 229 acres of moderate sensitivity lands Distance Zones: 229 acres in the foreground-middleground distance zone VRI Class: 229 acres of VRI Class IV lands Amendment of the land-use plan would result in the following changes to the overall Price Field Office VRM objectives: <u>COUT BAX-C:</u> 95 fewer acres of VRM Class III (currently 1,248,000 acres) and 95 more acres of VRM Class IV (currently 291,000 acres) <u>COUT BAX-E:</u> 229 fewer acres of VRM Class III (currently 1,248,000 acres) and 229 more acres of VRM Class IV (currently 291,000 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.			

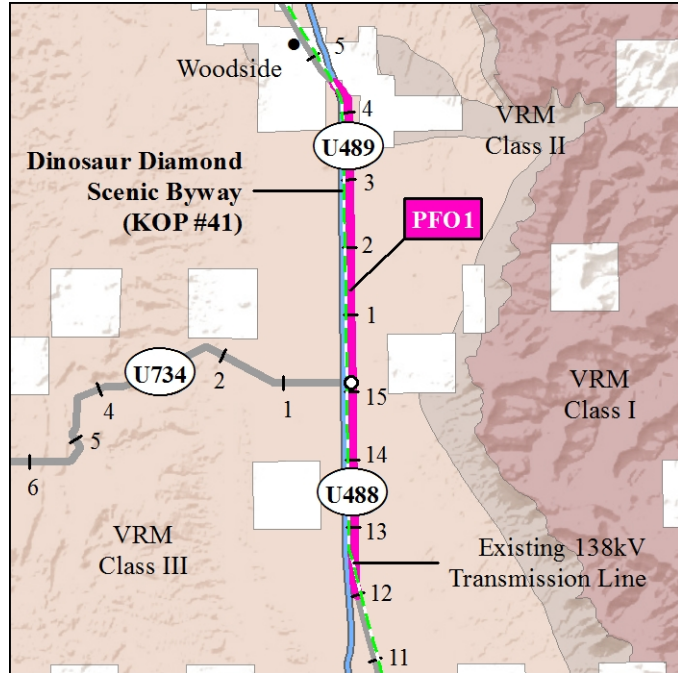


TABLE 5-16 BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO1	
Identification Number on Map 5-1b	 PFO1
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)
If 95 or 229 acres (depending on the selected alternative route) adjacent to U.S. Highway 6 were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project. Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Price RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-17 BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO2		
Identification Number on Map 5-1b	PFO2	
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the Wedge Overlook/Buckhorn Draw Scenic Backway would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #218.	
Description of Potential Plan Amendment	The relevant goals and objectives for visual resource management (page 77) in the Price RMP currently state: “Goals: - Identify scenic resources, integral landscapes, and vistas that contribute to the sense of place and quality of life of visitors and residents. Assign VRM classes to all landscapes. - Manage scenic resources, integral vistas, and landscapes for the benefit of local residents and visitors. - Identify acceptable levels of manmade contrast on area landscapes. Objectives: - Over the life of the plan management actions will be conducted in a manner that protects scenic values and landscapes through the use of the Visual Management System. - Use proper design techniques and mitigation measures, future projects and use authorizations under this plan to minimize contrast with the characteristic landscape and not exceed the VRM Management Class Standards.” Additionally, specific management decisions are listed stating the VRM Class associated with different planning decisions. The following text will be added to amend the list of management decisions (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link U731 from Milepost 1.0 to 2.7 of the Project (approximately 1.7 miles) would be amended to VRM Class IV (a total of 51 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Price RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT BAX-B and COUT BAX-C	Link U731 1.7 miles

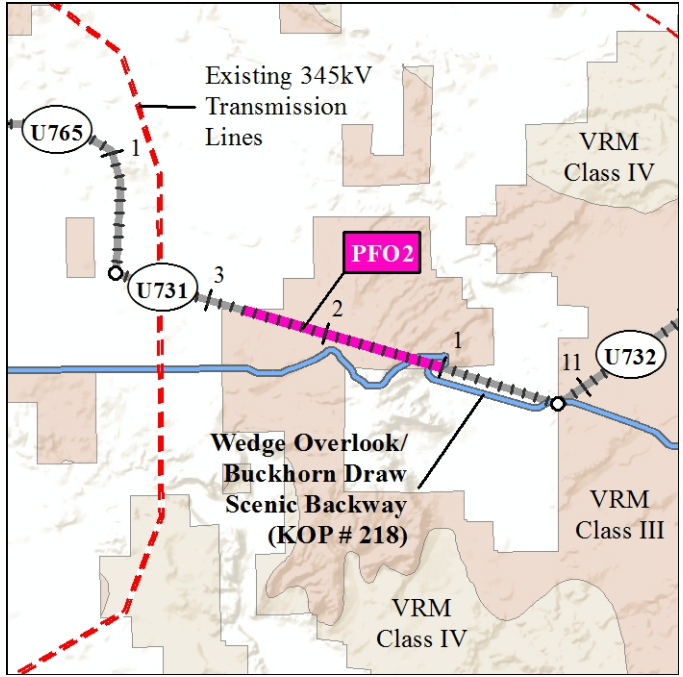
TABLE 5-17 BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO2	
Identification Number on Map 5-1b	PFO2
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)
Potential Environmental Effects	
The following components of the Price Field Office Visual Resource Inventory (VRI) are located within the planning area boundary: <u>Scenic Quality Rating Units</u>: 51 acres of Class C lands <u>Sensitivity Level Rating Units</u>: 45 acres of high and 6 acres of moderate sensitivity lands <u>Distance Zones</u>: 51 acres in the foreground-middleground distance zone <u>VRI Class</u>: 45 acres of VRI Class III and 6 acres of VRI Class IV lands Amendment of the land-use plan would result in the following changes to the overall Price Field Office VRM objectives: <u>COUT BAX-B</u>: 51 fewer acres of VRM Class III (currently 1,248,000 acres) and 51 more acres of VRM Class IV (currently 291,000 acres) <u>COUT BAX-C</u>: 51 fewer acres of VRM Class III (currently 1,248,000 acres) and 51 more acres of VRM Class IV (currently 291,000 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 51 acres adjacent to this scenic backway were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.	
	

TABLE 5-17 BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO2	
Identification Number on Map 5-1b	 PFO2
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Price RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-18 BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO3		
Identification Number on Map 5-1b	PFO3	
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the San Rafael Swell Destination Route (Green River Cutoff Road) would not be compliant with Visual Resource Management (VRM) Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #326.	
Description of Potential Plan Amendment	The relevant goals and objectives for visual resource management (page 77) in the Price RMP currently state: “Goals: - Identify scenic resources, integral landscapes, and vistas that contribute to the sense of place and quality of life of visitors and residents. Assign VRM classes to all landscapes. - Manage scenic resources, integral vistas, and landscapes for the benefit of local residents and visitors. - Identify acceptable levels of manmade contrast on area landscapes. Objectives: - Over the life of the plan management actions will be conducted in a manner that protects scenic values and landscapes through the use of the Visual Management System. - Use proper design techniques and mitigation measures, future projects and use authorizations under this plan to minimize contrast with the characteristic landscape and not exceed the VRM Management Class Standards.” Additionally, specific management decisions are listed stating the VRM Class associated with different planning decisions. The following text will be added to amend the list of management decisions (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link U734 from Milepost 0.0 to 10.7 of the Project (approximately 10.7 miles) would be amended to VRM Class IV (a total of 324 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Price RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT BAX-C	Link U734 10.7 miles

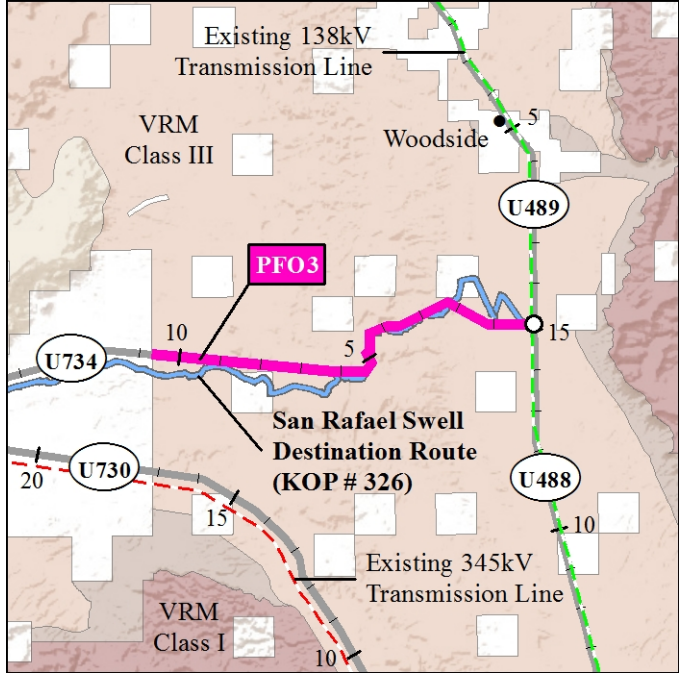
TABLE 5-18 BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO3	
Identification Number on Map 5-1b	PFO3
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)
Potential Environmental Effects	
The following components of the Price Field Office Visual Resource Inventory (VRI) are located within the planning area boundary: <u>Scenic Quality Rating Units</u>: 271 acres of Class B, and 53 acres of Class C lands <u>Sensitivity Level Rating Units</u>: 324 acres of moderate sensitivity lands <u>Distance Zones</u>: 324 acres in the foreground-middleground distance zone <u>VRI Class</u>: 271 acres of VRI Class III and 53 acres of VRI Class IV lands Amendment of the land-use plan would result in the following changes to the overall Price Field Office VRM objectives: <u>COUT BAX-C</u>: 324 fewer acres of VRM Class III (currently 1,248,000 acres) and 324 more acres of VRM Class IV (currently 291,000 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which the BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 324 acres adjacent to Green River Cutoff Road were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project. Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future,	
	

TABLE 5-18 BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO3	
Identification Number on Map 5-1b	 PFO3
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)
associated with other RFFAs, the Price RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

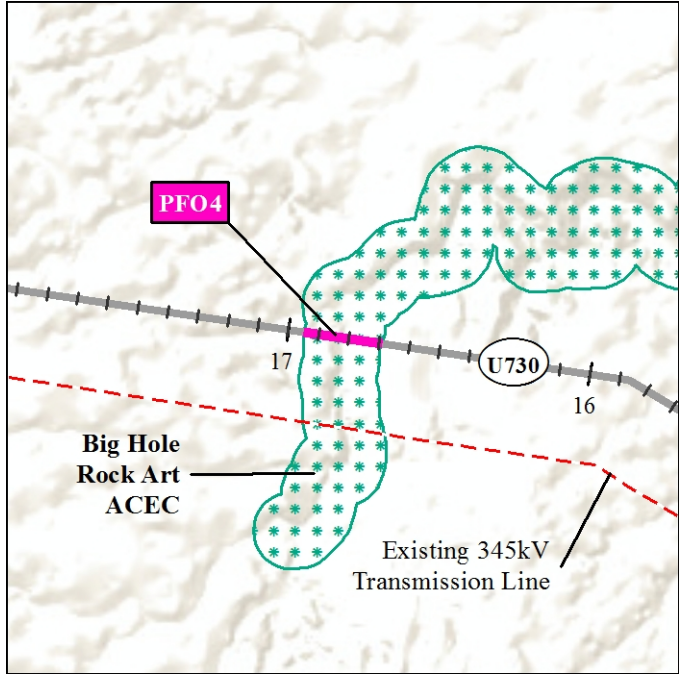
TABLE 5-19 BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO4		
Identification Number on Map 5-1b	PFO4	
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management 2008d)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Crosses Big Hole Rock Art Area of Critical Environmental Concern, an exclusion area for new utility corridors.	
Description of Potential Plan Amendment	Special management prescriptions in Special Designations section of the Approved Resource Management Plan, under the subheading <i>Rock Art Area of Critical Environmental Concern</i> (page 136) would be amended as follows (<i>new text in bold italics</i>): “Manage with the following special management prescriptions: - Oil and gas will be open to leasing subject to major constraints (NSO) - Closed to disposal of mineral materials - Recommended for withdrawal from locatable mineral entry - Excluded for [right-of-way] grants. <i>This stipulation could be granted an exception by the Field Manager if conditions warrant and the decision is documented through environmental analysis. An exception would suspend the stipulation on a one-time basis.</i>”	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT BAX-B	Link U730 0.2 mile
Potential Environmental Effects		
Direct and Indirect Effects The direct and indirect effects on the resources attributed to amending the stipulation to grant a one-time exception would be same as the direct and indirect effects of constructing, operating, and maintaining the Project described for Alternative COUT BAX-B in Chapter 3, since this amendment would allow the Project to be permitted on this route. Cumulative Effects Cumulative effects from allowing a one-time exception would likely result in similar cumulative effects on resources from this Project in Chapter 4. Allowing a one-time exception could create a siting opportunity for future projects as this area would become more dominated by transmission lines, such as the TransWest Express Project or other future extra-high voltage transmission lines if additional exceptions were granted. The addition of these potential projects has the potential to further impact visual values from viewing locations through additional structures, vegetation management activities, and access roads in this area.		
		

TABLE 5-20 BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO5		
Identification Number on Map 5-1b	PFO5	
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	New utility corridors in these areas will require a potential land-use plan amendment.	
Description of Potential Plan Amendment	The right-of-way decision presented in in the Lands and Realty section of the Approved Resource Management Plan (RMP) under LAR-23 (page 122) would be amended as follows (<i>new text in bold italics</i>): “LAR-23 All utility corridors within the PFO are designated for any size utility and transportation uses needed. The corridors are 1 mile in width crossing any BLM-administered public lands, <i>with the exception of the utility corridor established along Interstate 70 (I-70), which is 1.5 miles in width.</i> These approved corridors will be the preferred location for future major linear [rights-of-way] that meet the following criteria: ▪ Pipelines with a diameter greater than 16 inches ▪ Transmission (not distribution) lines with a voltage capacity of 69 kV or greater ▪ Significant conduits requiring a permanent width greater than 50 feet. Map R-21 in the Approved RMP also would be revised to show the amended corridor width along I-70.”	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT BAX-B	Links U629 0.1 mile U730 0.2 mile U731 0.4 mile U732 2.1 miles
	COUT BAX-C	Links U629 0.1 mile U731 0.4 mile U732 2.1 miles U734 10.1 miles
	COUT BAX-E	Links U493 6.1 miles U495 9.9 miles U485 0.4 mile
	COUT-C	Links U406 0.9 mile U408 0.4 mile
	COUT-C-4 AND COUT-C-5	Links U411 2.5 miles
	COUT-H	Links U406 0.9 mile U408 0.4 mile

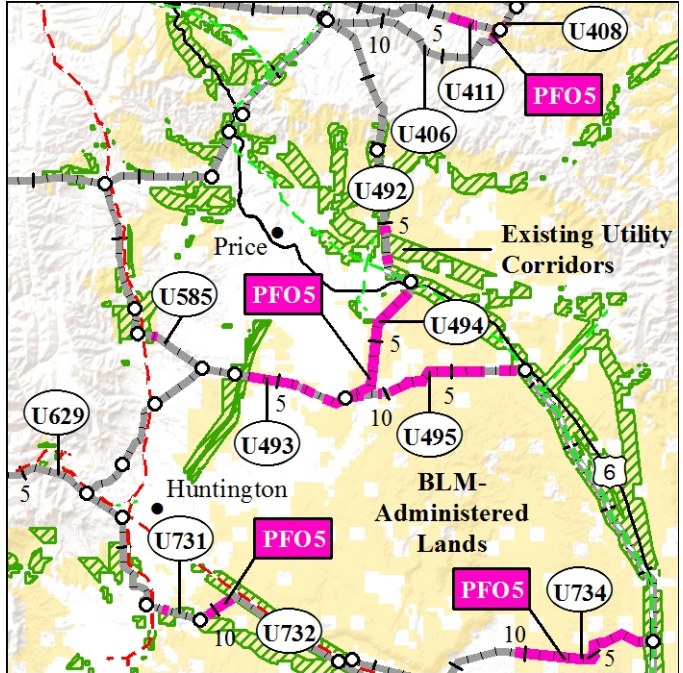
TABLE 5-20 BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO5		
Identification Number on Map 5-1b	PFO5	
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-I	<u>Links</u> U406 0.9 mile U408 0.4 mile U492 1.1 miles U493 6.1 miles U494 9.2 miles U629 0.1 mile
Potential Environmental Effects		
Direct and Indirect Effects The direct and indirect effects on the resources attributed to amending the width of the existing utility corridor to allow additional utilities, such as the Project, would be the same as the direct and indirect effects of constructing, operating, and maintaining the Project described for Alternatives COUT BAX-B, COUT BAX-C, COUT BAX-E, COUT-C (including Route Variations COUT-C-4 and COUT-C-5), COUT-H, and COUT-I in Chapter 3, since this amendment would allow the Project to be permitted on this route. Cumulative Effects Cumulative effects from amending the corridor width would likely result in similar cumulative effects on resources from this Project in Chapter 4. By amending the land-use plan to modify the utility corridor width, the Project or other future extra-high voltage transmission lines could be sited in these lands and these areas would become more dominated by transmission lines. The addition of these potential projects has the potential to further impact visual values from viewing locations through additional structures, vegetation management activities, and access roads in this area.		
		

TABLE 5-21 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO1	
Identification Number on Map 5-1b	 VFO1
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Could Decision Require Amendment?	Yes
Nonconformance Issue	New utilities must cross the Green River at Fourmile Bottom. The alternative route crosses in the designated area, which is also designated as Visual Resource Management (VRM) Class II. Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Green River at Fourmile Bottom would not be compliant with VRM Class II objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #203, and associated visual simulation. Crossing the Green River outside of the Fourmile Bottom area also would not be compliant with Lands and Realty Decision LAR-31 in the Approved RMP.
Description of Potential Plan Amendment	The relevant goals and objectives for visual resource management (page 136) in the Vernal RMP currently state: “Goals and Objectives: • Manage the public lands (see Figure 16a) in such a way to preserve those scenic vistas, which are deemed to be most important. • In their impact on the quality of life for residents and communities in the areas. • In their contribution to the quality of recreational visitor experiences. • In supporting the regional tourism industry and segments of the local economy dependent on public land resources. • Seek to complement the rural, agricultural, historic, and urban landscapes on adjoining private, state, and tribal lands by maintaining the integrity of background vistas on the public lands.” Additionally, specific management decisions are listed by VRM Class including VRM-4 which states “Approximately 786,612 acres will be managed as VRM Class III”. The following text will be added to amend management decision VRM-4 (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class II lands (associated with the Lower Green River Corridor Area of Critical Environmental Concern) along Link U400 from Mileposts 6.5 to 7.0 and 7.1 to 8.4 of the Project (approximately 1.8 miles) would be amended to VRM Class III (a total of 55 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class II after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Vernal RMP would facilitate accommodation of the Project with revised plan VRM objectives.

TABLE 5-21 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO1		
Identification Number on Map 5-1b	VFO1	
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)	
	Lands and Realty decision LAR-31 in Section E (page 89), Management Decisions, of the Approved RMP would be amended as follows (<i>new text in bold italics</i>): “LAR-31 Future [rights-of-way] that cross the Lower or Upper Green River will be placed in the Fourmile Bottom Area or at the Head of Little Swallow Canyon. <i>An exception could be granted by the Field Manager to allow for the placement of the right-of-way for the construction, operation, and maintenance of the Energy Gateway South Transmission Project up to 1 mile north of the existing pipelines in the Fourmile Bottom area if, after application of all feasible mitigation measures, environmental analysis indicated more acceptable impacts than siting the Project right-of-way adjacent to existing pipelines in the Fourmile Bottom Area.”</i>	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-C and all route variations, COUT-H, and COUT-I	Link U400 1.8 miles
Potential Environmental Effects		
The following components of the Vernal Field Office Visual Resource Inventory (VRI) are located within the planning area boundary: <u>Scenic Quality Rating Units</u>: 7 acres of Class A and 48 acres of Class C lands <u>Sensitivity Level Rating Units</u>: 55 acres of high sensitivity lands <u>Distance Zones</u>: 55 acres in the foreground-middleground distance zone <u>VRI Class</u>: 7 acres of VRI Class II and 48 acres of VRI Class III lands Amendment of the land-use plan would result in the following changes to the overall Vernal Field Office VRM objectives: <u>COUT-C</u>: 55 fewer acres of VRM Class II (currently 231,911 acres) and 55 more acres of VRM Class III (currently 786,612 acres) <u>COUT-H</u>: 55 fewer acres of VRM Class II (currently 231,911 acres) and 55 more acres of VRM Class III (currently 786,612 acres) <u>COUT-I</u>: 55 fewer acres of VRM Class II (currently 231,911 acres) and 55 more acres of VRM Class III (currently 786,612 acres) Direct and Indirect Effects This area is currently managed as VRM Class II which BLM Manual 8410-1 describes as retaining the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract attention from the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.		

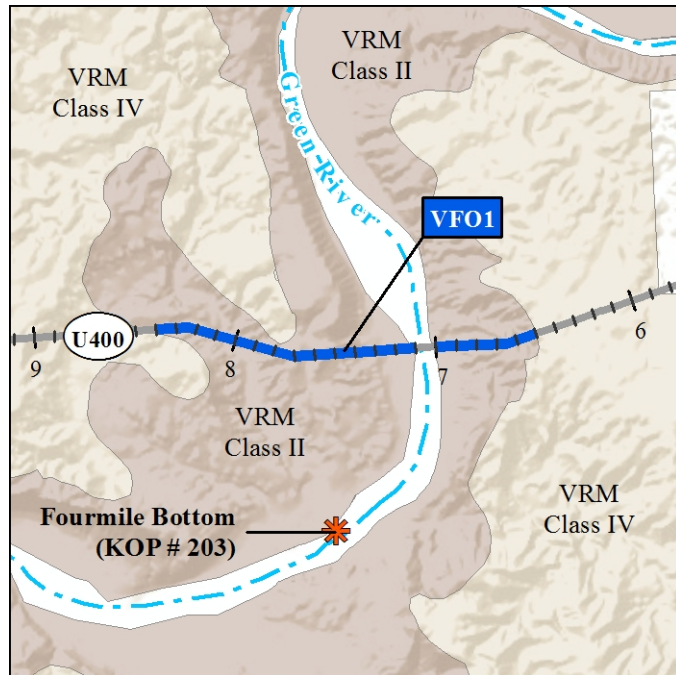


TABLE 5-21 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO1	
Identification Number on Map 5-1b	 VFO1
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
If 55 acres adjacent to the Green River were amended from VRM Class II to VRM Class III, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.” Amending a portion of the VRM Class designation from the existing VRM Class II to VRM Class III would allow changes to the characteristic landscape to increase from needing to retain landscape character to accept instead, activities to only partially retain landscape character. Management activities that under the existing VRM Class should not attract attention would be allowed to attract attention as long as views would not be dominated. The change of current planning direction would result in, but not be limited to, the allowance of the Project. Amendment of LAR-31 of the Approved RMP to allow siting of the Project to cross the Green River up to 1 mile north of Fourmile Bottom area would eliminate crossing of clay reed-mustard habitat, avoid Uinta Basin hookless cactus transplant areas, and would likely result in the Project crossing fewer miles of Level 1 Sclerocactus core habitat potentially reducing the number of Uinta Basin hookless cactus individuals to be relocated. However, locating the Project up to 1 mile north of Fourmile Bottom Area would have increased impacts on the scenery adjacent to the Green River and recreation views from the river than if colocated with the existing pipelines, which have already influenced visual values adjacent to the river. Note the Green River has been identified as a suitable wild and scenic river segment (with a tentative “scenic” classification); and the Lower Green River Corridor Area of Critical Environmental Concern has been designated for riparian habitat and scenery values, where both the existing alternative route and a route modification to the north would cross the river. Per BLM Manual 6400 - Wild and Scenic Rivers (Section 3.61), “additional or new [right-of-way] facilities should be located, to the greatest extent possible, to share, parallel or adjoin an existing right-of-way. If the Project were sited in Moon Bottom, it would not share, parallel, or adjoin an existing right-of-way. There also would be increased visibility of the Project from the river since transmission structures would be sited in gentler terrain along a river bend where views of the Project would be longer in duration. The potential to encounter cultural resource sites of great significance to the Ute Tribe would be anticipated at any crossing of the Green River. At least one sacred site has been identified by the Ute Tribe in the Fourmile Bottom area and several tower sites attributed to the Fremont occupation of the region are known along this section of the river. Further investigation would be required to identify specific impacts to cultural resources and the potential for avoidance or mitigation of those impacts. Cumulative Effects As currently managed as VRM Class II, the Project and other reasonably foreseeable future actions (RFFA) that could moderately contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class II objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class III, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Vernal RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-21 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO1	
Identification Number on Map 5-1b	 VFO1
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Amendment of LAR-31 of the Approved RMP to allow siting of the Project to cross the Green River up to 1 mile north of Fourmile Bottom area would create a siting opportunity for future linear utility projects, such as the TransWest Express Project or other future overhead transmission lines. By the introduction of the Project into these areas, the level of surface disturbance and potential for negative impacts to Uinta Basin hookless cactus and other special status plants would be increased. However, if the disturbance from similar RFFAs were consolidated in defined linear corridors, cumulative effects on Uinta Basin hookless cactus and other special status plants would not be additive for each subsequent RFFA (e.g., overhead transmission lines).	

TABLE 5-22 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO2		
Identification Number on Map 5-1b	VFO2	
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects resulting from the proximity of the Project to the Enron Recreation Area would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Worksheet, Key Observation Point #87, and associated visual simulations.	
Description of Potential Plan Amendment	The relevant goals and objectives for visual resource management (page 136) in the Vernal RMP currently state: “Goals and Objectives: • Manage the public lands (see Figure 16a) in such a way to preserve those scenic vistas, which are deemed to be most important. • In their impact on the quality of life for residents and communities in the areas. • In their contribution to the quality of recreational visitor experiences. • In supporting the regional tourism industry and segments of the local economy dependent on public land resources. • Seek to complement the rural, agricultural, historic, and urban landscapes on adjoining private, state, and tribal lands by maintaining the integrity of background vistas on the public lands.” Additionally, specific management decisions are listed by VRM Class including VRM-5 which states “Approximately 643,641 acres will be managed as VRM Class IV”. The following text will be added to amend management decision VRM-5 (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link U300 from Milepost 8.6 to 8.9 of the Project (approximately 0.3 mile) would be amended to VRM Class IV (a total of 9 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Vernal RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-C and all route variations, COUT-H, and COUT-I	Link U300 0.3 mile

TABLE 5-22 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO2	
Identification Number on Map 5-1b	VFO2
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Potential Environmental Effects	
The following components of the Vernal Field Office Visual Resource Inventory (VRI) are located within the planning area boundary: <u>Scenic Quality Rating Units</u>: 6 acres of Class A and 3 acres of Class C lands <u>Sensitivity Level Rating Units</u>: 9 acres of moderate sensitivity lands <u>Distance Zones</u>: 9 acres in the foreground-middleground distance zone <u>VRI Class</u>: 6 acres of VRI Class II and 3 acres of VRI Class IV lands Amendment of the land-use plan would result in the following changes to the overall Vernal Field Office VRM objectives: <u>COUT-C</u>: 9 fewer acres of VRM Class III (currently 786,612 acres) and 9 more acres of VRM Class IV (currently 643,641 acres) <u>COUT-H</u>: 9 fewer acres of VRM Class III (currently 786,612 acres) and 9 more acres of VRM Class IV (currently 643,641 acres) <u>COUT-I</u>: 9 fewer acres of VRM Class III (currently 786,612 acres) and 9 more acres of VRM Class IV (currently 643,641 acres)	
	The map shows a topographic view of the Vernal Field Office planning area. A dashed blue line represents the White River flowing from the top left towards the center. A solid black line represents the Enron Recreation Area (KOP # 87) boundary. A blue rectangle labeled 'VFO2' is located within the planning area. A dashed orange line outlines the boundary of VRM Class III, which is shaded in light orange. The area outside this boundary is labeled 'VRM Class IV'. A road labeled 'U300' is shown as a dashed line with tick marks, passing through the planning area. The numbers '8' and '9' are placed near the road. A small orange star is located near the intersection of the White River and the Enron Recreation Area boundary.
Direct and Indirect Effects This area is currently managed as VRM Class III which the BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 9 acres adjacent to the White River were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.	

TABLE 5-22	
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO2	
Identification Number on Map 5-1b	 VFO2
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Vernal RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-23 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO3		
Identification Number on Map 5-1b	VFO3	
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Nine Mile Canyon Scenic Backway would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #273.	
Description of Potential Plan Amendment	The relevant goals and objectives for visual resource management (page 136) in the Vernal RMP currently state: “Goals and Objectives: • Manage the public lands (see Figure 16a) in such a way to preserve those scenic vistas, which are deemed to be most important. • In their impact on the quality of life for residents and communities in the areas. • In their contribution to the quality of recreational visitor experiences. • In supporting the regional tourism industry and segments of the local economy dependent on public land resources. • Seek to complement the rural, agricultural, historic, and urban landscapes on adjoining private, state, and tribal lands by maintaining the integrity of background vistas on the public lands.” Additionally, specific management decisions are listed by VRM Class including VRM-5 which states “Approximately 643,641 acres will be managed as VRM Class IV”. The following text will be added to amend management decision VRM-5 (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link U401 from Milepost 1.3 to 2.6 of the Project (approximately 1.3 miles) would be amended to VRM Class IV (a total of 41 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Vernal RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-C and all route variations, COUT-H, and COUT-I	Link U401 1.3 miles

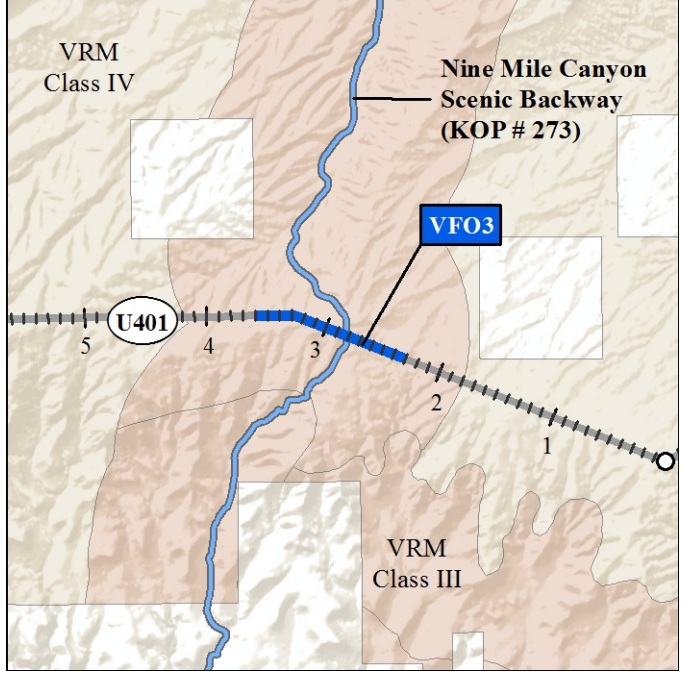
TABLE 5-23 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO3	
Identification Number on Map 5-1b	VFO3
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Potential Environmental Effects	
The following components of the Vernal Field Office Visual Resource Inventory (VRI) are located within the planning area boundary : <u>Scenic Quality Rating Units</u>: 41 acres of Class B lands <u>Sensitivity Level Rating Units</u>: 41 acres of high sensitivity lands <u>Distance Zones</u>: 41 acres in the foreground-middleground distance zone <u>VRI Class</u>: 41 acres of VRI Class II lands Amendment of the land-use plan would result in the following changes to the overall Vernal Field Office VRM objectives: <u>COUT-C</u>: 41 fewer acres of VRM Class III (currently 786,612 acres) and 41 more acres of VRM Class IV (currently 643,641 acres) <u>COUT-H</u>: 41 fewer acres of VRM Class III (currently 786,612 acres) and 41 more acres of VRM Class IV (currently 643,641 acres) <u>COUT-I</u>: 41 fewer acres of VRM Class III (currently 786,612 acres) and 41 more acres of VRM Class IV (currently 643,641 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 41 acres adjacent to this scenic backway were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.	
	

TABLE 5-23 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO3	
Identification Number on Map 5-1b	 VFO3
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Vernal RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-24 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO4								
Identification Number on Map 5-1b	VFO4							
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)							
Could Decision Require Amendment?	Yes							
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Argyle Canyon Road would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Worksheets, Key Observation Point #200, and associated visual simulation.							
Description of Potential Plan Amendment	The relevant goals and objectives for visual resource management (page 136) in the Vernal RMP currently state: “Goals and Objectives: • Manage the public lands (see Figure 16a) in such a way to preserve those scenic vistas, which are deemed to be most important. • In their impact on the quality of life for residents and communities in the areas. • In their contribution to the quality of recreational visitor experiences. • In supporting the regional tourism industry and segments of the local economy dependent on public land resources. • Seek to complement the rural, agricultural, historic, and urban landscapes on adjoining private, state, and tribal lands by maintaining the integrity of background vistas on the public lands.” Additionally, specific management decisions are listed by VRM Class including VRM-5 which states “Approximately 643,641 acres will be managed as VRM Class IV”. The following text will be added to amend the management decision VRM-5 (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link U404 from Mileposts 2.8 to 3.2, 3.7 to 4.0, 4.2 to 4.5, and 4.8 to 4.9 and Link U407 from Milepost 0.3 to 1.0 of the Project (approximately 1.8 miles) would be amended to VRM Class IV (a total of 51 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Vernal RMP would facilitate accommodation of the Project with revised plan VRM objectives.							
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-C and all route variations, COUT-H, and COUT-I	<table><tr><td>Links</td><td></td></tr><tr><td>U404</td><td>1.1 miles</td></tr><tr><td>U407</td><td>0.7 mile</td></tr></table>	Links		U404	1.1 miles	U407	0.7 mile
Links								
U404	1.1 miles							
U407	0.7 mile							

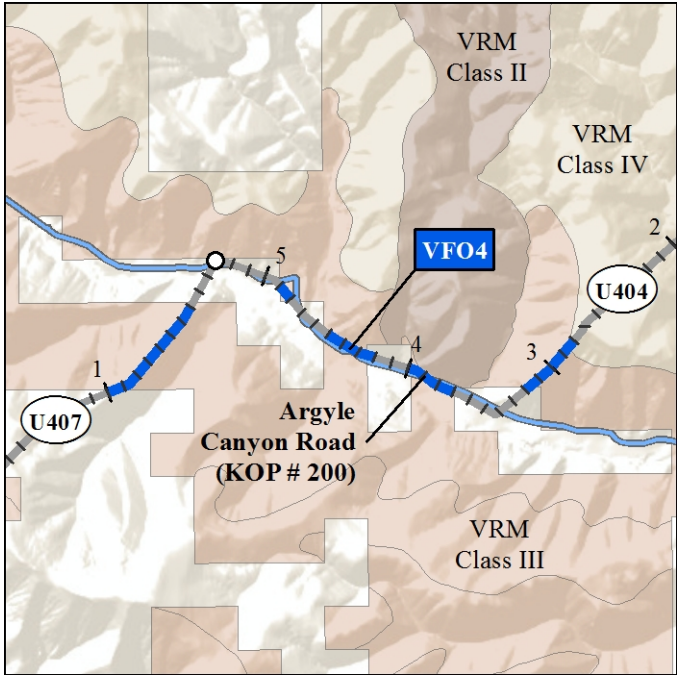
TABLE 5-24 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO4	
Identification Number on Map 5-1b	VFO4
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Potential Environmental Effects	
The following components of the Vernal Field Office Visual Resource Inventory (VRI) are located within the planning area boundary: <u>Scenic Quality Rating Units</u>: 51 acres of Class A lands <u>Sensitivity Level Rating Units</u>: 51 acres of high sensitivity lands <u>Distance Zones</u>: 51 acres in the foreground-middleground distance zone <u>VRI Class</u>: 51 acres of VRI Class II lands Amendment of the land-use plan would result in the following changes to the overall Vernal Field Office VRM objectives:: <u>COUT-C</u>: 51 fewer acres of VRM Class III (currently 786,612 acres) and 51 more acres of VRM Class IV (currently 643,641 acres) <u>COUT-H</u>: 51 fewer acres of VRM Class III (currently 786,612 acres) and 51 more acres of VRM Class IV (currently 643,641 acres) <u>COUT-I</u>: 51 fewer acres of VRM Class III (currently 786,612 acres) and 51 more acres of VRM Class IV (currently 643,641 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 51 acres adjacent to Argyle Canyon Road were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.	
	

TABLE 5-24 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO4	
Identification Number on Map 5-1b	 VFO4
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Vernal RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-25 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO5		
Identification Number on Map 5-1b	VFO5	
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the Reservation Ridge Scenic Backway would not be compliant with Visual Resource Management (VRM) Class III objectives established in the RMP for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #329.	
Description of Potential Plan Amendment	The relevant goals and objectives for visual resource management (page 136) in the Vernal RMP currently state: “Goals and Objectives: • Manage the public lands (see Figure 16a) in such a way to preserve those scenic vistas, which are deemed to be most important. • In their impact on the quality of life for residents and communities in the areas. • In their contribution to the quality of recreational visitor experiences. • In supporting the regional tourism industry and segments of the local economy dependent on public land resources. • Seek to complement the rural, agricultural, historic, and urban landscapes on adjoining private, state, and tribal lands by maintaining the integrity of background vistas on the public lands.” Additionally, specific management decisions are listed by VRM Class including VRM-5 which states “Approximately 643,641 acres will be managed as VRM Class IV”. The following text will be added to amend management decision VRM-5 (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link U513 from Mileposts 3.3 to 4.4, 4.5 to 5.8, and 6.1 to 6.5 of the Project (approximately 2.8 miles) would be amended to VRM Class IV (a total of 78 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Vernal RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-B-1 and COUT-C-1	Link U513 2.8 miles

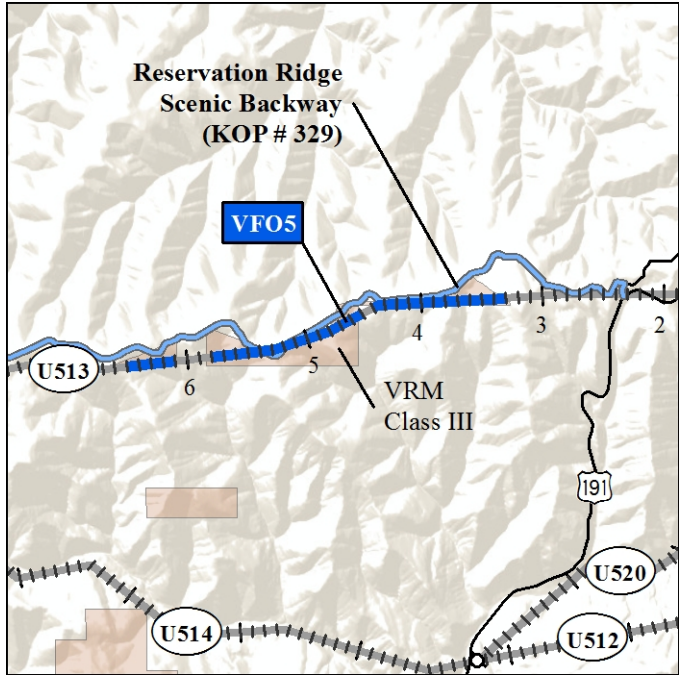
TABLE 5-25 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO5	
Identification Number on Map 5-1b	VFO5
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Potential Environmental Effects	
The following components of the Vernal Field Office Visual Resource Inventory (VRI) are located within the planning area boundary: <u>Scenic Quality Rating Units</u>: 78 acres of Class A lands <u>Sensitivity Level Rating Units</u>: 78 acres of high sensitivity lands <u>Distance Zones</u>: 78 acres in the foreground-middleground distance zone <u>VRI Class</u>: 78 acres of VRI Class II lands Amendment of the land-use plan would result in the following changes to the overall Vernal Field Office VRM objectives: <u>COUT-B-1</u>: 78 fewer acres of VRM Class III (currently 786,612 acres) and 78 more acres of VRM Class IV (currently 643,641 acres) <u>COUT-C-1</u>: 78 fewer acres of VRM Class III (currently 786,612 acres) and 78 more acres of VRM Class IV (currently 643,641 acres)	
Direct and Indirect Effects This area is currently managed as VRM Class III which the BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 78 acres adjacent to this scenic backway were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.	
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures.	

TABLE 5-25 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO5	
Identification Number on Map 5-1b	 VFO5
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Vernal RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-26 BUREAU OF LAND MANAGEMENT RICHFIELD FIELD OFFICE PLAN AMENDMENT		
Identification Number on Map 5-1b	Not applicable	
Resource Management Plan	Richfield Field Office, Record of Decision and Approved Resource Management Plan (Bureau of Land Management 2008e)	
Could Decision Require Amendment?	No	
Nonconformance Issue	Not applicable	
Description of Potential Plan Amendment	None	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	Not applicable	Not applicable
Potential Environmental Effects		
Not applicable		

TABLE 5-27 BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO1		
Identification Number on Map 5-1b	MFO1	
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Old U.S. Highway 6 would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #245.	
Description of Potential Plan Amendment	The relevant goals and objectives for visual resource management (page 135) in the Moab RMP currently state: “Goals and Objectives: • Manage public lands in a manner that protects the quality of scenic values. • Recognize and manage visual resource for overall multiple use, filming, and recreational opportunities for visitors to public lands. • Manage BLM actions to preserve those scenic vistas that are most important,” Additionally, specific management decisions are listed. The following text will be add to amend the management decisions to include a new management decision, VRM-15 (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link U490 from Milepost 0.0 to 6.3 of the Project (approximately 6.3 mile) would be amended to VRM Class IV (a total of 189 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Moab RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Link U490 6.3 miles

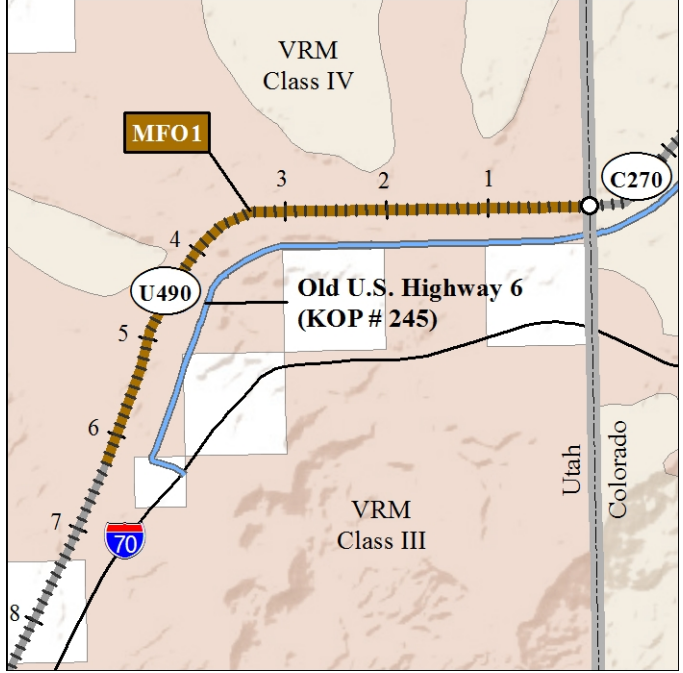
TABLE 5-27 BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO1	
Identification Number on Map 5-1b	MFO1
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)
Potential Environmental Effects	
The following components of the Moab Field Office Visual Resource Inventory (VRI) are located within the planning area boundary: <u>Scenic Quality Rating Units</u>: 189 acres of Class C lands <u>Sensitivity Level Rating Units</u>: 74 acres of moderate and 115 acres of low sensitivity lands <u>Distance Zones</u>: 189 acres in the foreground-middleground distance zone <u>VRI Class</u>: 189 acres of VRI Class IV lands Amendment of the land-use plan would result in the following changes to the overall Moab Field Office VRM objectives: <u>COUT BAX-B</u>: 189 fewer acres of VRM Class III (currently 829,158 acres) and 189 more acres of VRM Class IV (currently 268,133 acres) <u>COUT BAX-C</u>: 189 fewer acres of VRM Class III (currently 829,158 acres) and 189 more acres of VRM Class IV (currently 268,133 acres) <u>COUT BAX-E</u>: 189 fewer acres of VRM Class III (currently 829,158 acres) and 189 more acres of VRM Class IV (currently 268,133 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 189 acres adjacent to Old U.S. Highway 6 were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.	
	

TABLE 5-27 BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO1	
Identification Number on Map 5-1b	 MFO1
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Moab RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-28 BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO2		
Identification Number on Map 5-1b	MFO2	
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects resulting from the proximity of the Project to the Harley Dome Rest Area (along I-70) would not be compliant with Visual Resource Management Class (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #152, and associated visual simulation.	
Description of Potential Plan Amendment	The relevant goals and objectives for visual resource management (page 135) in the Moab RMP currently state: “Goals and Objectives: • Manage public lands in a manner that protects the quality of scenic values. • Recognize and manage visual resource for overall multiple use, filming, and recreational opportunities for visitors to public lands. • Manage BLM actions to preserve those scenic vistas that are most important,” Additionally, specific management decisions are listed. The following text will be add to amend the management decisions to include a new management decision, VRM-15 (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link U490 from Milepost 4.3 to 5.3 of the Project (approximately 1.0 mile) would be amended to VRM Class IV (a total of 31 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Moab RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Link U490 1.0 mile

TABLE 5-28 BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO2	
Identification Number on Map 5-1b	MFO2
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)
Potential Environmental Effects	
The following components of the Moab Field Office Visual Resource Inventory (VRI) are located within the planning area boundary : <u>Scenic Quality Rating Units</u>: 31 acres of Class C lands <u>Sensitivity Level Rating Units</u>: 16 acres of moderate and 15 of low sensitivity lands <u>Distance Zones</u>: 31 acres in the foreground-middleground distance zone <u>VRI Class</u>: 31 acres of VRI Class IV lands Amendment of the land-use plan would result in the following changes to the overall Moab Field Office VRM objectives: <u>COUT BAX-B</u>: 31 fewer acres of VRM Class III (currently 829,158 acres) and 31 more acres of VRM Class IV (currently 268,133 acres) <u>COUT BAX-C</u>: 31 fewer acres of VRM Class III (currently 829,158 acres) and 31 more acres of VRM Class IV (currently 268,133 acres) <u>COUT BAX-E</u>: 31 fewer acres of VRM Class III (currently 829,158 acres) and 31 more acres of VRM Class IV (currently 268,133 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 31 acres adjacent to the Harley Dome Rest Area were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.	

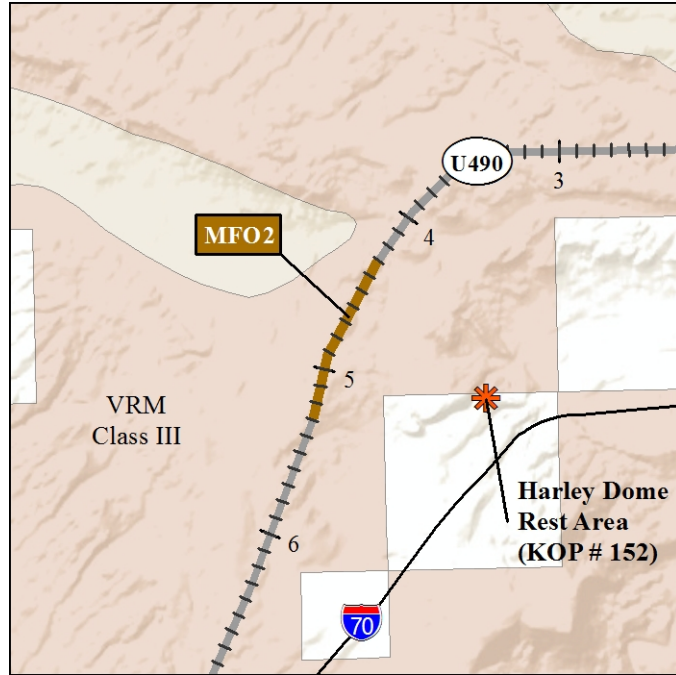


TABLE 5-28 BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO2	
Identification Number on Map 5-1b	 MFO2
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Moab RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-29 BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO3		
Identification Number on Map 5-1b	MFO3	
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (BLM 2008c)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Interstate 70 would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix H – Contrast Rating Worksheet, Key Observation Point #246.	
Description of Potential Plan Amendment	The relevant goals and objectives for visual resource management (page 135) in the Moab RMP currently state: “Goals and Objectives: • Manage public lands in a manner that protects the quality of scenic values. • Recognize and manage visual resource for overall multiple use, filming, and recreational opportunities for visitors to public lands. • Manage BLM actions to preserve those scenic vistas that are most important,” Additionally, specific management decisions are listed. The following text will be add to amend the management decisions to include a new management decision, VRM-15 (<i>new text in bold italics</i>): <i>“The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project within VRM Class III lands along Link U490 from Mileposts 6.3 to 7.3, 8.5 to 12.0, 12.4 to 13.5, 13.8 to 16.3, 16.8 to 24.9, and 25.3 to 25.6 and Link U486 Milepost 0.0 to 1.8 of the Project (approximately 18.4 miles) would be amended to VRM Class IV (a total of 555 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur within VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.”</i> Amendment of this decision in the Moab RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT BAX-C and COUT BAX-E	<u>Links</u> U490 16.6 miles U486 1.8 miles

TABLE 5-29 BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO3	
Identification Number on Map 5-1b	MFO3
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (BLM 2008c)
Potential Environmental Effects	
The following components of the Moab Field Office Visual Resource Inventory (VRI) are located within the planning area boundary : <u>Scenic Quality Rating Units</u>: 555 acres of Class C lands <u>Sensitivity Level Rating Units</u>: 555 acres of moderate sensitivity lands <u>Distance Zones</u>: 555 acres in the foreground-middleground distance zone <u>VRI Class</u>: 555 acres of VRI Class IV lands Amendment of the land-use plan would result in the following changes to the overall Moab Field Office VRM objectives:: <u>COUT BAX-B</u>: 555 fewer acres of VRM Class III (currently 829,158 acres) and 555 more acres of VRM Class IV (currently 268,133 acres) <u>COUT BAX-C</u>: 555 fewer acres of VRM Class III (currently 829,158 acres) and 555 more acres of VRM Class IV (currently 268,133 acres) <u>COUT BAX-E</u>: 555 fewer acres of VRM Class III (currently 829,158 acres) and 555 more acres of VRM Class IV (currently 268,133 acres) Direct and Indirect Effects This area is currently managed as VRM Class III which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 555 acres adjacent to Interstate 70 were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided within BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.” Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.	

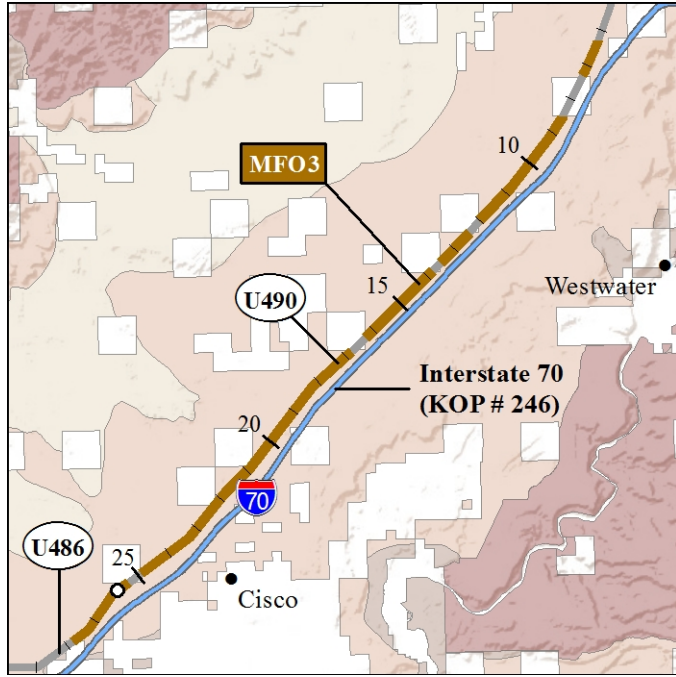


TABLE 5-29 BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO3	
Identification Number on Map 5-1b	 MFO3
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (BLM 2008c)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigating measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Moab RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-30 MANTI-LA SAL NATIONAL FOREST PLAN AMENDMENT MLSNF1		
Identification Number on Map 5-1b	MLSNF1	
Resource Management Plan	Manti-La Sal National Forest, Land and Resource Management Plan, 1986, as amended (U.S.Forest Service [USFS] 1986b)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Per a standard for the General Big-game Winter Range Management Unit (management emphasis is on general big-game winter range) in the 1986 Manti-La Sal National Forest states that activities must meet the Visual Quality Objective (VQO) except where habitat improvement activities occur. Due to the proximity of the Project to U.S. Highway 89 and residences in the Birdseye, Utah, area, the Project would not be subordinate to the characteristic landscape in these areas, which would be inconsistent with the definition of a partial retention VQO.	
Description of Potential Plan Amendment	The area within the Project right-of-way that is inconsistent with a partial retention VQO that could not be mitigated through application of selective mitigation measures (Link U621 Milepost 4.4 to 5.1) would be amended from a partial retention VQO to a modification VQO.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT-A, COUT-B, and COUT-C alternative routes and route variations	Link U621 0.7 mile
Potential Environmental Effects		
The following changes to the overall Manti-La Sal National Forest Visual Management System VQOs would occur through the amendment of this area: <u>COUT-A</u>: 20 fewer acres of a partial retention VQO (currently 186,012 acres) and 20 more acres of a modification VQO (currently 66,070 acres) <u>COUT-B</u>: 20 fewer acres of a partial retention VQO (currently 186,012 acres) and 20 more acres of a modification VQO (currently 66,070 acres) <u>COUT-C</u>: 20 fewer acres of a partial retention VQO (currently 186,012 acres) and 20 more acres of a modification VQO (currently 66,070 acres) Direct and Indirect Effects This area is currently managed as a partial retention VQO which USFS Handbook 462 describes as an area where management activities remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, and texture common to the characteristic landscape, but changes in their qualities of sizes, amount, intensity, direction, pattern, etc., remain visually subordinate to the characteristic landscape. Activities may also introduce form, line, color, or texture which are found infrequently or not at all in the characteristic landscape, but they should remain subordinate to the visual strength of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 20 acres near U.S. Highway 89 and the community of Birdseye were amended from a partial retention VQO to a modification VQO, then the VQO would be amended in accordance with the description provided within USFS		

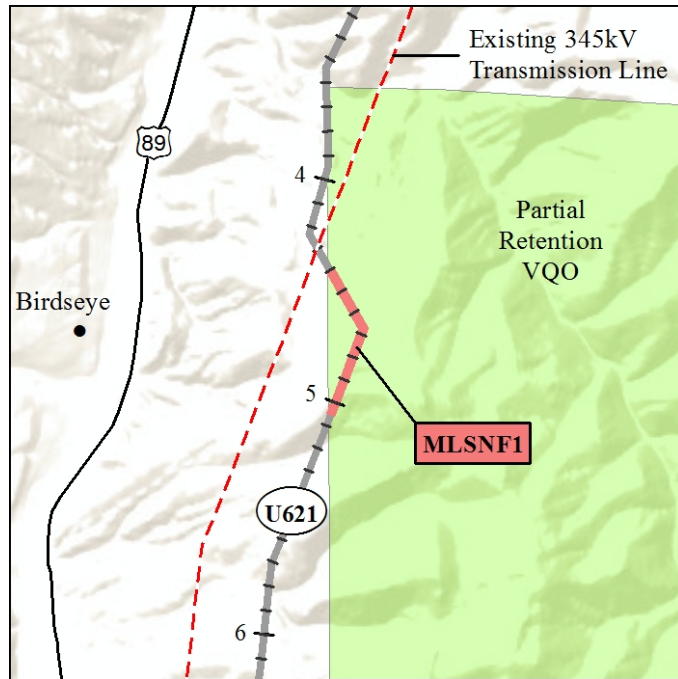


TABLE 5-30 MANTI-LA SAL NATIONAL FOREST PLAN AMENDMENT MLSNF1	
Identification Number on Map 5-1b	 MLSNF1
Resource Management Plan	Manti-La Sal National Forest, Land and Resource Management Plan, 1986, as amended (U.S.Forest Service [USFS] 1986b)
Handbook 462: “Management activities may visually dominate the original characteristic landscape. However, activities of vegetative and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type. Additional parts of these activities such as structures, roads, slash, root wads, etc., must remain visually subordinate to the proposed composition. Activities which are predominately introduction of facilities such as buildings, signs, roads, etc., should borrow naturally established form, line, color, and texture so completely and at such scale that its visual characteristics are compatible with the natural surroundings..” Amending a portion of the VQO designation from the existing partial retention VQO to a modification VQO would allow changes to the characteristic landscape to increase from needing to remain visually subordinate instead; management activities may visually dominate the characteristic landscape. The change of current planning direction would result in, but not be limited to, the allowance of the Project. Cumulative Effects As currently managed as a partial retention VQO, the Project and other reasonably foreseeable future actions (RFFA) that could visually dominate the characteristic landscape would not be permitted in this area unless determined to meet existing objectives through application of mitigating measures. By amending the land-use plan to change the VQO of this area to a modification VQO, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Manti-La Sal LRMP could be amended to change the VQO of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

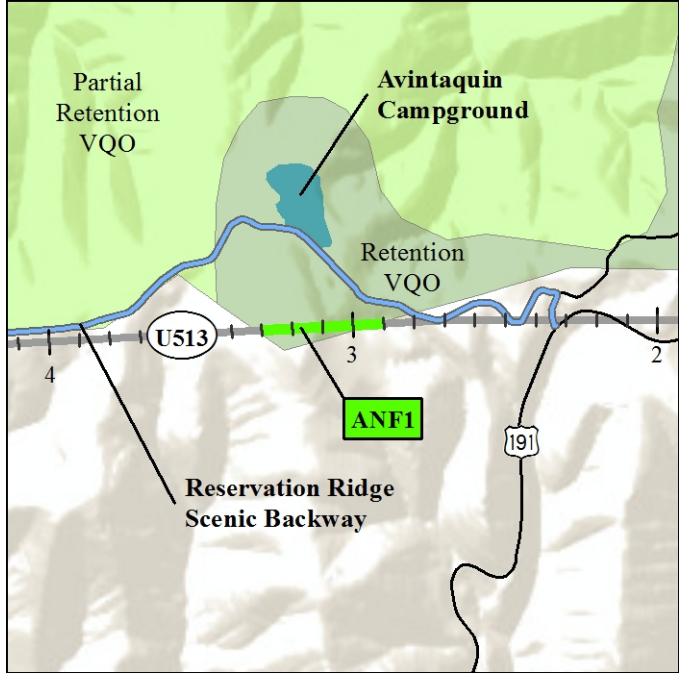
TABLE 5-31 ASHLEY NATIONAL FOREST PLAN AMENDMENT ANF1		
Identification Number on Map 5-1b	ANF1	
Resource Management Plan	Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Serviced [USFS] 1986a)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	A forest-wide standard in the 1986 Ashley National Forest Land and Resource Management Plan states that the forest will manage visual resource according to the adopted Visual Quality Objective (VQO). Due to proximity to the Avintaquin Campground and paralleling the Reservation Ridge Scenic Backway, the Project would not be consistent with retention VQO.	
Description of Potential Plan Amendment	The area within the Project right-of-way that is inconsistent with a retention VQO that could not be mitigated through application of selective mitigation measures (Link U513 Milepost 2.9 to 3.3) would be amended from a retention VQO to a modification VQO.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-B-1 and COUT-C-1	Link U513 0.4 mile
Potential Environmental Effects		
The following changes to the overall Ashley National Forest Visual Management System VQOs would occur through the amendment of these areas: COUT-B-1: 12 fewer acres of a retention VQO (currently 473,545 acres) and 12 more acres of a modification VQO (currently 316,949 acres) COUT-C-1: 12 fewer acres of a retention VQO (currently 473,545 acres) and 12 more acres of a modification VQO (currently 316,949 acres) Direct and Indirect Effects This area is currently managed as a retention VQO which USFS Handbook 462 describes as an area where management activities are not to be visually evident. Activities may only repeat form, line, color, and texture which are frequently found in the characteristic landscape. Changes in their qualities of size, amount, intensity, pattern, etc., should not be evident. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 12 acres near the Avintaquin Campground were amended from a retention VQO to a modification VQO, then the VQO would be amended in accordance with the description provided within USFS Handbook 462: “Management activities may visually dominate the original characteristic landscape. However, activities of vegetative and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type. Additional parts of these activities such as structures, roads, slash, root wads, etc., must remain visually subordinate to the proposed composition. Activities which are predominately introduction of facilities such as buildings, signs, roads, etc., should borrow naturally established form, line,		
		

TABLE 5-31 ASHLEY NATIONAL FOREST PLAN AMENDMENT ANF1	
Identification Number on Map 5-1b	 ANF1
Resource Management Plan	Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Serviced [USFS] 1986a)
color, and texture so completely and at such scale that its visual characteristics are compatible with the natural surroundings.” Amending a portion of the VQO designation from the existing retention VQO to a modification VQO would allow changes to the characteristic landscape to increase from not being visually evident instead; management activities may visually dominate the characteristic landscape. The change of current planning direction would result in, but not be limited to, the allowance of the Project. Cumulative Effects As currently managed as a retention VQO, the Project and other reasonably foreseeable future actions (RFFA) that could be visually evident within the characteristic landscape would not be permitted in this area unless determined to meet existing objectives through application of mitigating measures. By amending the land-use plan to change the VQO of this area to a modification VQO, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Ashley LRMP could be amended to change the VQO of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-32 ASHLEY NATIONAL FOREST PLAN AMENDMENT ANF2		
Identification Number on Map 5-1b	ANF2	
Resource Management Plan	Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Service [USFS] 1986a)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	A forest-wide standard in the 1986 Ashley National Forest Land and Resource Management Plan states that the forest will manage visual resource according to the adopted Visual Quality Objective (VQO). Due to paralleling the Reservation Ridge Scenic Backway, the Project would not be consistent with a partial retention VQO.	
Description of Potential Plan Amendment	The area within the Project right-of-way that is inconsistent with a partial retention VQO that could not be mitigated through application of selective mitigation measures (Link U515 Mileposts 1.2 to 1.6 and 4.4 to 4.5) would be amended from a partial retention VQO to a modification VQO.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-B-1, COUT-B-2, AND COUT-B-4 AND COUT-C-1, COUT-C-2, AND COUT-C-4	Link U515 0.5 mile
Potential Environmental Effects		
The following changes to the overall Ashley National Forest Visual Management System VQOs would occur through the amendment of these area: <u>COUT-B-1</u>: 13 fewer acres of a partial retention VQO (currently 240,485 acres) and 13 more acres of a modification VQO (currently 316,949 acres) <u>COUT-B-2</u>: 13 fewer acres of a partial retention VQO (currently 240,485 acres) and 13 more acres of a modification VQO (currently 316,949 acres) <u>COUT-B-4</u>: 13 fewer acres of a partial retention VQO (currently 240,485 acres) and 13 more acres of a modification VQO (currently 316,949 acres) <u>COUT-C-1</u>: 13 fewer acres of a partial retention VQO (currently 240,485 acres) and 13 more acres of a modification VQO (currently 316,949 acres) <u>COUT-C-2</u>: 13 fewer acres of a partial retention VQO (currently 240,485 acres) and 13 more acres of a modification VQO (currently 316,949 acres) <u>COUT-C-4</u>: 13 fewer acres of a partial retention VQO (currently 240,485 acres) and 13 more acres of a modification VQO (currently 316,949 acres) Direct and Indirect Effects This area is currently managed as a partial retention VQO which USFS Handbook 462 describes as an area where management activities remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, and texture common to the characteristic landscape, but changes in their qualities of sizes, amount, intensity, direction, pattern, etc., remain visually subordinate to the characteristic landscape. Activities may also introduce form, line, color, or texture which are found infrequently or not at all in the characteristic landscape, but		

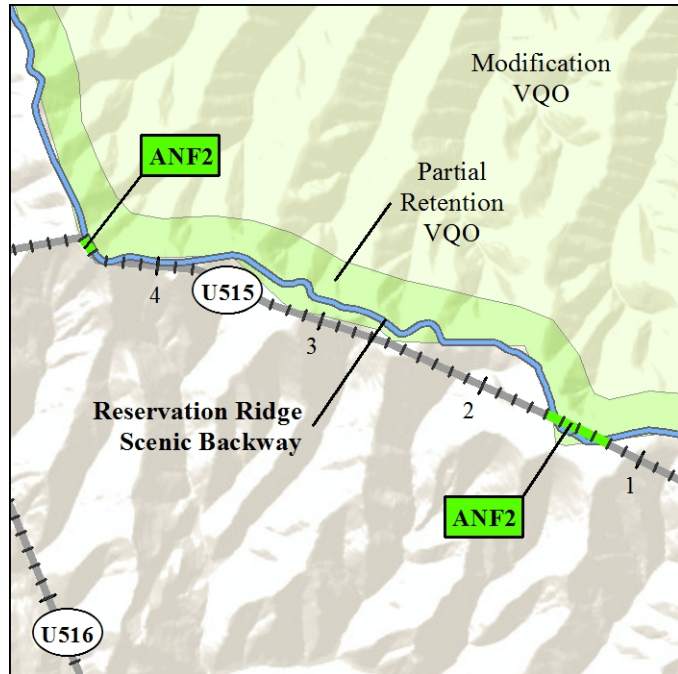
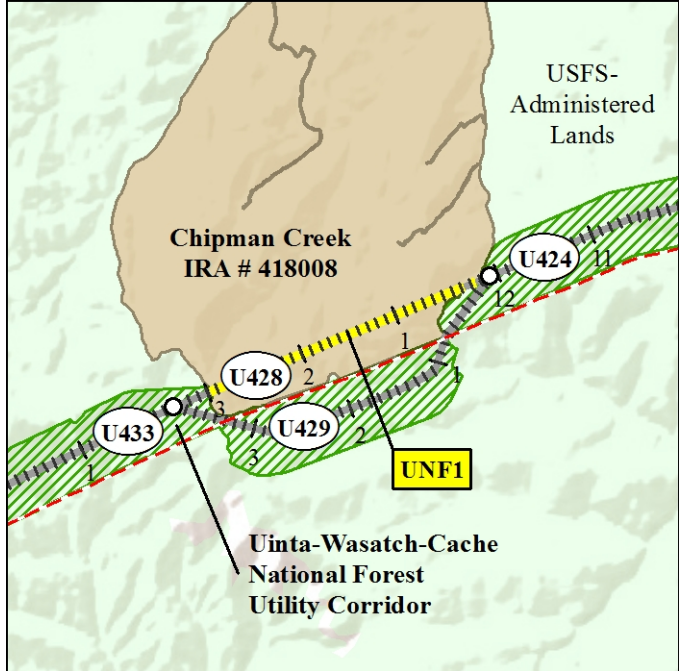


**TABLE 5-32
ASHLEY NATIONAL FOREST PLAN AMENDMENT ANF2**

Identification Number on Map 5-1b	 ANF2
Resource Management Plan	Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Service [USFS] 1986a)
they should remain subordinate to the visual strength of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area. If 13 acres adjacent to the Reservation Ridge Scenic Backway were amended from a partial retention VQO to a modification VQO, then the VQO would be amended in accordance with the description provided within USFS Handbook 462: “Management activities may visually dominate the original characteristic landscape. However, activities of vegetative and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type. Additional parts of these activities such as structures, roads, slash, root wads, etc., must remain visually subordinate to the proposed composition. Activities which are predominately introduction of facilities such as buildings, signs, roads, etc., should borrow naturally established form, line, color, and texture so completely and at such scale that its visual characteristics are compatible with the natural surroundings.” Amending a portion of the VQO designation from the existing partial retention VQO to a modification VQO would allow changes to the characteristic landscape to increase from needing to remain visually subordinate instead; management activities may visually dominate the characteristic landscape. The change of current planning direction would result in, but not be limited to, the allowance of the Project. Cumulative Effects As currently managed as a partial retention VQO, the Project and other reasonably foreseeable future actions (RFFA) that could visually dominate the characteristic landscape would not be permitted in this area unless determined to meet existing objectives through application of mitigating measures. By amending the land-use plan to change the VQO of this area to a modification VQO, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore in the future, associated with other RFFAs, the Ashley LRMP could be amended to change the VQO of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

TABLE 5-33 UINTA NATIONAL FOREST PLAN AMENDMENT UNF1		
Identification Number on Map 5-1b	UNF1	
Resource Management Plan	Uinta National Forest, Record of Decision for the Final Environmental Impact Statement and Revised Land and Resource Management Plan, 2003, as amended (U.S. Forest Service [USFS] 2003)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Due to being outside of the Uinta National Forest utility corridor where crossing the inventoried roadless area, the Project would not be consistent with the Uinta National Forest LRMP.	
Description of Potential Plan Amendment	The area within the Project right-of-way that is inconsistent with the utility corridor limitations would be amended to include the Project right-of-way under the applicable utility corridor.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-A-1	<u>Link</u> U428 2.8 mile
Potential Environmental Effects		
Direct and Indirect Effects The direct and indirect effects on the resources attributed to amending the plan to include the Project right-of-way as a utility corridor would be the same as the direct and indirect effects of constructing, operating, and maintaining the Project described for Route Variation COUT-A-1 in Chapter 3, since this amendment would allow the Project to be permitted on this route. Cumulative Effects Including the Project right-of-way as a utility corridor could allow additional utilities to be located within the corridor. If additional utilities are developed, such as the TransWest Express Project or other future extra-high voltage transmission lines, they would likely result in cumulative effects on resources similar to cumulative effects from this Project discussed in Chapter 4. Including the Project right-of-way as a utility corridor could allow increased access into an area previously closed to vehicular traffic. Including the Project right-of-way as a utility corridor could create a siting opportunity for future projects as this area would become more dominated by transmission lines, such as the TransWest Express Project or other future extra-high voltage transmission lines if additional exceptions were granted. The addition of these potential projects has the potential to further impact visual values from viewing locations through additional structures, vegetation management activities, and access roads in this area.		
		

CHAPTER 6 – CONSULTATION AND COORDINATION

6.1 Introduction

Integrated with the planning, analysis, and review activities of EIS preparation, the BLM is conducting a comprehensive program of agency coordination and public participation, commencing with scoping early on and continuing throughout the NEPA and land-use planning process. The intent of the program is to proactively encourage interaction between the BLM and other federal and state agencies, local governments, American Indian tribes, and the public to keep them informed about the Project through dissemination of information and to solicit information that assists in analysis and decision-making.

Throughout the preparation of this document, formal and informal efforts have been implemented by the BLM to involve, consult, and coordinate with other federal and state agencies and local governments, American Indian tribes, and the public. Such communication is important (1) to ensure the most appropriate data have been gathered and employed for analysis and (2) to ensure agency policy and public sentiment and values are considered and incorporated into decision-making.

This chapter provides a brief description of the methods employed for communication and interaction, which includes consultation and coordination with agencies, tribes, and stakeholders; the scoping process; Applicant-initiated activities; and public review of the Draft EIS and LUPAs.

6.1.1 Consultation and Coordination

Agencies and organizations having jurisdiction and/or specific interest in the Project were contacted at the beginning of scoping, during the resource inventory, and prior to the publication of the EIS to inform them of the Project, verify the status and availability of existing environmental data, request data and comments, and solicit their input about the Project. Additional contacts were made throughout the process to clarify information or update data. All conversations with agency personnel have been documented, distributed to the appropriate Project personnel, and are maintained in the Project administrative record. Specific concerns and recommendations have been discussed and documented for further action. This section describes the consultation and coordination activities that have taken place throughout the NEPA and land-use planning process.

6.2 Early Agency Coordination

As mentioned previously, the Applicant submitted the original application for right-of-way across federal land on November 28, 2007. Most of the federal land crossed by the alternative routes is administered by the BLM; therefore, the BLM was designated the lead agency responsible for preparing the EIS and LUPAs and other documentation in compliance with federal laws, regulations, or policies.

The following year, the Applicant revised the description of the Project and preliminary alternative routes, and submitted to the BLM a revised right-of-way application on December 17, 2008. In early 2009, the BLM Project Manager arranged meetings in February and March with each of the BLM District and Field Offices as well as the National Forests that could be affected by the Project. The purpose of these meetings was to introduce the Project; discuss the process and schedule for preparing the EIS and other environmental documentation; discuss the preliminary alternative routes to be analyzed; and to discuss potential resource conflicts, potential issues, and data needs.

Follow-up working sessions were conducted early in and ongoing throughout the NEPA process to discuss the preliminary alternative routes and potential issues in more detail. These working sessions are listed in Table 6-1.

TABKE 6-1 LIST OF AGENCY WORK SESSIONS	
Date	Agencies
June 2009	Bureau of Land Management (BLM) Wyoming State Office, BLM Little Snake Field Office, Colorado State Land Board, Colorado Division of Wildlife, Moffat County
September 2009	BLM Wyoming State Office, BLM Price Field Office, Rocky Mountain Power, TransWest Express, LLC
April 2010	BLM Wyoming State Office, BLM Price Field Office, U.S. Forest Service, U.S. Army Corps of Engineers, Utah Public Lands Policy Coordination Office, Rocky Mountain Power
July 2010	BLM Wyoming State Office, BLM Rawlins Field Office, BLM Rock Springs Field Office, BLM Little Snake Field Office, Wyoming Governor's Office, U.S. Fish and Wildlife Service, Wyoming Game and Fish Department, Carbon County, Little Snake River Conservation District, Saratoga-Encampment-Rawlins Conservation District, Rocky Mountain Power
October 2011	BLM Wyoming State Office, BLM Price Field Office, Emery County
December 2011	BLM Wyoming State Office, BLM Price Field Office, Emery County
July 2012	BLM Wyoming State Office, BLM Price Field Office, BLM Richfield Field Office, BLM Vernal Field Office, Ashley National Forest, Dixie National Forest, Manti – La Sal National Forest, Uinta-Wasatch-Cache National Forest, Utah Division of Wildlife Resources, Carbon County, Sanpete County, Duchesne County
August 2012	BLM Wyoming State Office, Dixie National Forest, Uinta-Wasatch-Cache National Forest
November 2012	BLM Wyoming State Office, Utah Reclamation Mitigation and Conservation Commission, U.S. Bureau of Reclamation, and Central Utah Water Conservation District
December 2012	BLM Wyoming State Office, BLM Northwest District Office, BLM Little Snake Field Office, National Park Service, Colorado Parks and Wildlife
June 2013	BLM Wyoming State Office, BLM Rawlins Field Office
December 2013	BLM Wyoming State Office, BLM Utah State Office, BLM Vernal Field Office, BLM National Transmission Support Team

6.2.1 Cooperating Agencies

In late May and June 2009, the BLM sent formal letters inviting all agencies and tribes whose jurisdiction and/or expertise are relevant to the Project to participate as cooperating agencies in the preparation of the EIS and LUPAs. The BLM conducted conference calls on January 14 and 21, 2010, to orient the participating agency personnel to the Project and to discuss their roles and responsibilities on the Project. The agencies that accepted the invitation to participate as cooperating agencies are listed below.

Federal

- Department of Agriculture
 - Forest Service, Intermountain Region
- Department of Defense
 - Army Corps of Engineers
 - Army Environmental Center
 - Navy, Southwest Region
- Department of the Interior
 - Bureau of Indian Affairs
 - Fish and Wildlife Service
 - National Park Service
- Utah Reclamation Mitigation and Conservation Commission

States

- Wyoming
- Utah
- Colorado

Counties

- Wyoming
 - Carbon County
 - Sweetwater County
- Colorado
 - Mesa County
 - Moffat County
 - Rio Blanco County
- Utah
 - Carbon County
 - Duchesne County
 - Emery County
 - Grand County
 - Juab County
 - Sanpete County
 - Uintah County
 - Utah County
 - Wasatch County

Wyoming Conservation Districts

- Little Snake River
- Medicine Bow
- Saratoga-Encampment-Rawlins
- Sweetwater County

Conference calls of the Agency Interdisciplinary Team, including the cooperating agencies, have been conducted once or twice each month to discuss the status of the Project, and to exchange information. In addition, to date, four in-person meetings have been held at key milestones in the NEPA and land-use planning process. The four meetings held and the purpose of each meeting is as follows:

- **September 13, 14, and 16, 2011.** BLM reviewed Project management and administrative protocols, schedule, scoping activities and results, and alternative routes being carried forward for further analysis, and discussed potential plan amendments and resource data collection and inventories. A meeting was held in each of the three states—Wyoming, Colorado, and Utah.
- **December 13, 2011.** BLM reviewed the status of the alternative routes and resource data collection, and reviewed the approach for assessing impacts, planning measures to mitigate impacts, and screening and comparing the alternative routes. The meeting was conducted by webcast.
- **August 20, 22, and 23, 2012.** BLM reviewed resource inventory data, discussed resources issues, and discussed the approach for impact assessment and mitigation planning. A meeting was held in each of the three states.
- **February 5, 6, and 7, 2013.** BLM reviewed the first administrative Draft EIS, discussed comments from the agencies, and initiated discussions to identify an Agency Preferred Alternative. A meeting was held in each of the three states.

Coordination with the Agency Interdisciplinary Team will continue through the completion of the EIS LUPAs and POD.

6.2.2 Consultation

The BLM is required to prepare EISs in coordination with any studies or analyses required by the Fish and Wildlife Conservation Act (16 U.S.C. 661 et seq.), ESA (16 U.S.C. 1531 et seq.), and the NHPA, as amended (16 U.S.C. 470 et seq.). Also, in accordance with Executive Order 13175, BLM must consult, government to government, with American Indians to ensure the tribes are informed about actions that may affect them.

6.2.2.1 Biological Resources

Under the provisions of Section 7(a)(2) of the ESA, a federal agency that carries out, permits, licenses, funds, or otherwise authorizes an activity must consult with the FWS as appropriate to ensure the action is not likely to jeopardize the continued existence of any species listed under the ESA or result in the destruction or adverse modification of designated critical habitat. Informal consultation for the Project began with the submittal of written correspondence to the FWS from the BLM on July 23, 27, and 30, 2009. At the direction of the FWS, the BLM obtained lists of federally threatened, endangered, and candidate species with the potential to occur in the Project area from the FWS. The species lists have been updated as new lists become available to reflect the current listing status of all federally listed and candidate species occurring potentially crossed by the Project.

Informal consultation among the BLM and cooperating agencies, including the FWS has continued throughout the development of the EIS including meetings, conference calls, letters, and other correspondence. In early 2010, the BLM established the BRTG composed of the biologists from the BLM, USFS, FWS, and the state wildlife agencies. The group meets via conference call once a month to discuss the status of the Project, issues, and approach to addressing key biological resource issues.

In early 2011, the FWS, BLM, USFS, BIA, and USACE, federal agencies with the authority and responsibility to perform certain actions associated with the Project, entered into a Consultation Agreement. Additional federal agencies signed the Agreement in 2013 (i.e., URMCC, NPS). The Agreement addresses interagency coordination for the affirmative conservation and recovery of listed species under Section 7(a)(1) of the ESA. Section 7(a)(1) directs all federal agencies to use their authorities in furtherance of the purposes of the ESA by “carrying out programs for the conservation and recovery of listed species.” Pursuant to Section 7 (a)(1), the Agreement clarifies agency roles during consultation under Section 7(a)(2) for the direct, indirect, and cumulative effects of the Proposed Action on listed species, species proposed for listing, and their associated designated or proposed critical habitat. In coordination with appropriate state natural-resource management agencies that have trust authority for nonlisted species, the Agreement also speaks to interagency coordination for the conservation of, and assessment of effects on, candidate species that may be affected by the Proposed Action.

Pursuant to Section 7(c)(1) of the ESA, the BLM, in cooperation with the appropriate cooperating agencies, will prepare a Biological Assessment to initiate formal consultation with the FWS and fulfill agency obligations under Section 7(a)(2) of the Act for the Agency Preferred Alternative route. The BLM will work collaboratively with the FWS to ensure that the FWS has an appropriate amount of time to review the information contained in the Biological Assessment and prepare a Biological Opinion prior to completion of a ROD or irreversible or irretrievable commitment of resources by any agency.

Additionally, the Applicant has convened a group of sage-grouse biologists from the BLM and cooperating agencies (the HEA Technical Working Group) to provide input and guidance during the development of the Applicant’s Sage-grouse Mitigation Plan, including the HEA component of the HEA. The agency biologists work closely with the Applicant to ensure adequacy of the mitigation analysis and corresponding final product, as well as addressing concerns and questions, developing assumptions for the analysis, and resolving issues as they arise. The HEA Technical Working Group meets as-needed during development of the Sage-grouse Mitigation Plan and HEA.

6.2.2.2 Cultural Resources

Section 106 (16 U.S.C. 470f) of the NHPA requires federal agencies to take into account the effect of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP, historic properties, including those listed on, or eligible for, the NRHP. Regulations for the implementation of Section 106 are defined in 36 CFR Part 800 – Protection of Historic Properties. These regulations define how federal agencies meet their statutory responsibilities as required under the law. The Section 106 process seeks to accommodate historic preservation concerns with the needs of federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties (36 CFR 800.1). These parties include the ACHP, SHPOs, American Indian tribes, Tribal Historic Preservation Officers, state and other federal agencies, and individuals or organizations with a demonstrated interest in the undertaking due to their legal or economic relation to the undertaking or affected properties, or their concern with the effects of undertakings on historic properties (36 CFR 800.2).

As lead federal agency for compliance with Section 106 of the NHPA, the BLM initiated Section 106 consultation with the SHPOs, PLPCO, SITLA, USFS, NPS, and ACHP pursuant to 36 CFR Part 800.6 and 800.14 (b) of the ACHP’s regulations implementing Section 106 of the NHPA in April 2010. The Section 106 process is separate from but often conducted parallel with the preparation of an EIS. To ensure compliance with Section 106, in 2010 the BLM assembled a formal group, the Cultural Resources Task Group (CRTG), composed of the BLM State Archaeologists from each of the three states and cultural resources specialists from USFS, BIA, NPS, and Utah PLPCO. The CRTG convenes at least once a month. Other agency cultural resources personnel may participate as consultation progresses.

Consultation under Section 106 of the NHPA is ongoing and will continue during post-EIS phases of Project implementation.

The BLM in consultation with the Wyoming, Colorado, and Utah SHPOs agreed to develop a Programmatic Agreement among the various state and federal agencies and consulting parties with an interest in the Project. A Programmatic Agreement outlines the stipulations that will be followed concerning the identification, assessment, and treatment of cultural resources for the Project in accordance with 36 CFR 800.15(b). Signatories agree that the Project will be administered in accordance with stipulations and measures set forth in the Programmatic Agreement. To date, the signatory parties include the BLM, USFS, NPS, three SHPOs, and ACHP. Additional signatory parties, invited signatory parties (e.g., the Applicant), and concurring parties have yet to be determined.

Through the development of a Programmatic Agreement, the BLM and cooperating agencies will outline a phased approach to fulfill the four requirements of Section 106: initiate consultation, identify historic properties, assess adverse effects, and resolve adverse effects. The first step (initiate consultation) requires the BLM to establish the undertaking, identify the appropriate SHPO(s) or Tribal Historic Preservation Office, plan to involve the public, and identify other consulting parties. This step is generally scheduled concurrently with the NEPA scoping efforts. The second step (identify historic properties) requires BLM to determine the scope of the efforts (e.g., the methodologies for each type of cultural resource study, the Project Area of Potential Effects for each study), identify historic properties (Class III intensive pedestrian inventories), and evaluate historic significance (i.e., apply the four NRHP criteria). During the third step, BLM assesses adverse effects on historic properties identified during the previous step. The second and third steps parallel the NEPA processes of drafting the EIS, conducting public hearings/workshops, and finalizing the EIS. The final step in the Section 106 process is the resolution of adverse effects, which will be documented in the HPTP. A copy of the Programmatic Agreement is will be provided in Appendix I of the Final EIS. The Programmatic Agreement will be complete prior to issuance of the ROD; however, stipulations may need to be included in the right-of-way grant requiring completion of agency-approved treatment of historic properties identified by agency archaeologists as needing further investigation before any Project-related ground-disturbing activities commence in the vicinity of the historic properties. If stipulations are included in the right-of-way grant, the Authorized Officer would issue a Notice to Proceed upon satisfactory completion of each investigation.

Government-to-Government and Section 106 Tribal Consultation

The United States has a unique legal relationship with American Indian tribal governments as set forth in the Constitution of the United States, treaties, Executive Orders (e.g., Executive Order 13175), federal statutes, federal policy, and tribal requirements, which establish the interaction that must take place between federal and tribal governments. An important basis for this relationship is the trust responsibility of the United States to protect tribal sovereignty, self-determination, tribal lands, tribal assets and resources, and treaty and other federally recognized and reserved rights. Government-to-government consultation is the process of seeking, discussing, and considering views on policy, and/or, in the case of this Project, environmental and cultural resource management issues. As part of the BLM's on-going government-to-government consultation, tribal officials were informed of the Project and those who expressed interest in the Project will be updated periodically on the status of the Project through the completion of the NEPA process. For efficiency, government-to-government consultation activities often are combined with Section 106 tribal consultation activities. The BIA, a fiduciary for the administration and management of surface land and subsurface minerals estate held in trust by the United States for American Indian tribes and individual Indians, is a cooperating agency involved in the preparation of the EIS and would authorize, with the approving consent of the Ute Indian Tribe, any rights-of-way over lands held in trust from the Ute Indian Tribe of the Uintah and Ouray Indian Reservation.

Pursuant to 36 CFR Part 800.2, the lead federal agency must consult with American Indian tribes that attach religious and cultural significance to historic properties that may be affected by an undertaking. This requirement applies regardless of the location of the historic property. In such cases, the federal agency must notify the tribes potentially affected by the undertaking and give those tribes the opportunity to participate in the Project as a concurring party should they wish to do so.

Federal legislation applicable to tribal consultation in the Project area includes:

- NHPA (16 U.S.C. 470; 36 CFR Part 800), specifically Section 106, directs federal agencies to take into account the effects of their actions on historic properties and provide the tribes a reasonable opportunity to comment.
- ARPA (16 U.S.C. 470aa to 470ee) authorizes federal land-management agencies to manage through a permit process the excavation and/or removal of archaeological resources on federal lands. The land-management agencies must consult with American Indian tribes with interests in resources prior to issuance of permits.
- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996) requires federal lead agencies and/or federal land-management agencies to consult with affected American Indian tribes regarding federal actions that would pose potential conflicts with freedom to practice traditional American Indian religions.
- NAGPRA (25 U.S.C. 3001-3002) provides a process through which federal agencies consult with affected Native Americans regarding the treatment and return of human remains, funerary objects, sacred objects, and items of cultural patrimony identified on federal lands as a result of a federal action.
- Executive Order 13007, issued in 1996, directs federal land-management agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of sacred sites. Where appropriate, agencies will maintain the confidentiality of these sites.
- Executive Order 13175, issued in 2000, charges each federal agency to engage in timely and meaningful consultation and collaboration with Indian tribal governments; strengthen the government-to-government relationship between the United States and Indian tribes; and reduce the imposition of unfunded mandates upon Indian tribes.
- Government-to-Government Relations with Native American Tribal Governments Memorandum (signed by President Clinton, April 29, 1994), 59 *Federal Register* 22951 (May 4, 1994) directs federal agencies to consult, to the greatest extent practicable and to the extent permitted by law, with tribal governments prior to taking actions that affect federally recognized tribal governments. Federal agencies must assess the impact of federal government plans, projects, programs, and activities on tribal trust resources and ensure that tribal government rights and concerns are considered during such development.
- Secretarial Order 3206, issued in 1997 by the Secretary of the Interior and the Secretary of Commerce pursuant to the ESA (16 U.S.C. 1531, as amended), the federal-tribal (i.e., government-to-government) trust relationship, and other federal law. The order directs component agencies of the USDI and the Department of Commerce to carry out their responsibilities under the ESA in a manner that harmonizes the federal trust responsibility to tribes, tribal sovereignty, and statutory missions of the departments, and that strives to ensure the Indian tribes do not bear a disproportionate burden for the conservation of listed species.
- USDI Policy on Consultation with Indian Tribes, outlines the USDI's consultation framework for fulfilling its tribal consultation obligations, including requirements for government-to-government consultation between tribal officials and department officials.

BLM Instruction Memorandum No. 2010-037: Tribal Consultation and Cultural Resource Authorities provides an update on the BLM’s tribal outreach initiative, emphasizes the importance of tribal relations and partnerships for the BLM, and discusses revision of the national Programmatic Agreement that the BLM maintains with the ACHP and National Conference of SHPOs. In addition, the SHPO for each state involved (Wyoming, Colorado, and Utah) is responsible for ensuring that laws applicable to tribal consultation are followed on lands under the jurisdiction of the state.

State of Wyoming statutes and guidelines include the following:

- At present, Wyoming has no state statutes pertaining to tribal consultations and/or the handling of inadvertently discovered human Native American remains.

State of Colorado statutes and guidelines include the following:

- Unmarked Human Graves. Discovery of human remains (Colorado Revised Statue 24-80-1302) requires examination of inadvertently discovered human remains within 48 hours of notification to determine if the remains are of forensic value. If the coroner determines that the remains are of no forensic value, then the coroner notifies the State Archaeologist, who makes an examination as soon as possible to determine if the remains are more than 100 years old and if they are Native American. If the remains are determined to be Native American, the State Archaeologist notifies the Secretary of the Colorado Commission Indian Affairs, who in turn notifies interested tribes in the region, via email or mail (by their choice) before removal.
- “Process for Consultation, Transfer and Reburial of Culturally Unidentifiable Native American Human Remains and Associated Funerary Objects Originating From Inadvertent Discoveries on Colorado State and Private Lands” is an agreement between the Colorado Commission of Indian Affairs and the Colorado Historical Society that establishes a process for the consultation, repatriation, and reburial of culturally unidentifiable Native American human remains and associated funerary objects inadvertently discovered on private and state lands in Colorado.

State of Utah statutes and guidelines include the following:

- UAC Section 9-9-403 provides a process for the ownership and disposition of Native American human remains discovered on nonfederal lands not state owned.
- UAC Section 76-9-704 provides the definitions and penalties for the abuse or desecration of a dead human body.
- UAC Section R212-4 requires that, if human remains are discovered in conjunction with a project subject to Section 106, the project proponent is responsible for all efforts associated with the excavation, analysis, curation, or repatriation of the human remains and for notifying the Utah SHPO.
- UAC Section 9-8-309 provides a process through which landowners or land-management agencies consult with the state regarding the treatment of human remains discovered on nonfederal lands not state owned.

Early in the NEPA process, BLM in coordination with the federal and state cooperating agencies, identified 33 American Indian tribes that may have a traditional association with the Project area. The BLM initiated contact with American Indian tribes in accordance with various environmental laws and Executive Orders¹. As part of scoping, the BLM mailed letters, dated April 2011, to the American Indian

¹ NEPA; NHPA, as amended; American Indian Religious Freedom Act of 1978; NAGPRA, as amended; FLPMA, ARPA of 1979; Executive Order 11593 – Protection and Enhancement of the Cultural Environment; Executive Order 12898 –

tribes listed in Table 6-1 that may have an interest in the Project area to inform them of and determine their interest in the Project.

The BLM received responses from four tribes. The Hopi Tribe responded in April 2011 that the tribe would participate in government-to-government consultation. The Pueblo of Laguna responded in April 2011 that the tribe had no objections to the Project at that time. The Ute Mountain Tribe of the Ute Mountain Reservation informed the BLM in May 2011 that they intend to consult on the Project. In July 2011, the Eastern Shoshone Tribe of the Wind River Reservation informed the BLM that they intend to consult on the Project. The BLM received no responses from the other 29 tribes.

In March 2012, the same 33 tribes were invited to participate in development of the Project Programmatic Agreement under Section 106 of NHPA and to sign as concurring parties. In April 2012, the tribes were invited to attend a meeting with Consulting Parties conducted by the BLM. The purpose of the meeting was for the BLM to (1) introduce the Project; (2) provide an overview of Section 106 of the NHPA; (3) discuss the purpose, use, and development of a Programmatic Agreement for the Project; (4) explain the Project schedule; and (5) provide those interested an opportunity to affirm their level of interest in the Project. The BLM received responses from four tribes in March 2012. The Hopi Tribe, Eastern Shoshone Tribe of the Wind River Reservation, and Pueblo of Santa Clara all responded that they intend to participate in the Section 106 process for the Project. The Confederated Tribes of the Goshute Indian Reservations informed the BLM that the tribe defers their Section 106 consultation to the Ute Indian Tribe of the Uintah and Ouray Indian Reservation. The BLM received no responses from the other 29 tribes.

In April 2012, the BLM mailed Project information materials for the April 2012 Section 106 Consulting Parties meeting to nine tribes (Eastern Shoshone Tribe of the Wind River Reservation, Hopi Tribe, Northern Arapaho Tribe of the Wind River Reservation, Paiute Indian Tribe of Utah, Pueblo of Santa Clara, Pueblo of Taos, Southern Ute Indian Tribe of the Southern Ute Reservation, Ute Mountain Ute of the Ute Mountain Reservation, and Ute Tribe of the Uintah and Ouray Reservation), based on the proximity of traditional tribal territories to the Project area or confirmation from the tribe that they intend to participate with the BLM in Section 106 consultation. The Hopi Tribe responded, informing the BLM that the tribe did not intend to participate in the meeting. The remaining eight tribes did not respond to the mailing.

On April 23, 2012, the BLM and Applicant met with representatives of the Ute Tribe Energy & Minerals Department, Uintah and Ouray Indian Reservation. The purpose of the meeting was to introduce and discuss the Project. Also, the BLM was invited to give a presentation to the TriUte Association on May 31, 2012, to introduce and discuss the Project. The BLM and Ute Tribe agreed to continue coordination.

In April 2013, a letter was sent to the Ute Tribe Energy & Minerals Department providing a status update on the Project and a request for the Ute Tribe to participate as a cooperating agency. A cooperating agency draft MOU was attached to the letter for review and consideration. In addition, a request was made to assist in scheduling a meeting with the Energy & Minerals Department or a meeting with the Business Council to discuss the Project. No response was received.

In May 2013, the BLM sent email messages to the Director, Ute Tribe Cultural Rights and Protection regarding scheduling a meeting to discuss National Historic Preservation Act Section 106 consultation and draft Programmatic Agreement. No response was received. In July 2013, another email message was sent to the Director to invite the Ute Tribe's participation in a Consulting Parties meeting on July 30,

Environmental Justice; Executive Order 13007 – Indian Sacred Sites; Executive Order 13175 – Consultation and Coordination with Indian tribal Governments

2013, in Price, Utah, to review and discuss the Section 106 draft Programmatic Agreement. Attached to the email was the draft Programmatic Agreement for review and comment. No response was received, nor was the Tribe represented at the meeting.

In August 2013, a letter was sent to the Ute Tribal Chairman and Council providing a status update on the Project and a request for the Ute Tribe to participate as a cooperating agency. A cooperating agency draft MOU was attached to the letter for review and consideration. In addition, a request was made to assist in scheduling a meeting with the Tribal Council, Business Council, or both to discuss the Project.

In January 2014, the BLM sent another letter to the Ute Tribal Chairman, with copies to the Tribal Council and heads of the tribal departments, to inform them of the upcoming availability of the Draft EIS (February 2014) and to request a meeting with the Tribal Council and/or Business Council. A chronology of BLM's outreach to the Ute Tribe was included with the letter.

Results of the consultation efforts to date are summarized in Table 6-2 and are documented in the Project administrative record.

The current status of tribal participation is summarized below.

- Thirty-three tribes have been contacted.
- Four tribes (Eastern Shoshone Tribe of the Wind River Reservation, Hopi Tribe, Pueblo of Santa Clara, and Ute Mountain Tribe of the Ute Mountain Reservation) have requested consultations.
- One tribe, the Confederate Tribes of the Goshute Indian Reservations, has deferred to the Ute Indian Tribe of the Uintah and Ouray Reservation to represent their interests and concerns regarding the Project during consultation with the BLM.
- As of the date of this Draft EIS, none of the tribes contacted have responded to the BLM's invitation to participate in the development of the Programmatic Agreement as concurring parties.

To date, the BLM has received no substantive comments from the tribes contacted.

6.2.3 Other Coordination

Several federal and state agencies and local governments were consulted during the course of the environmental studies to request data and solicit information and comments. A list of all agency and stakeholder meetings is presented in Appendix C. In addition, information provided by the Applicant on Applicant-initiated public outreach activities is included in Appendix C.

**TABLE 6-2
TRIBAL CONTACTS AND CONSULTATION**

Tribe	Type of Contact			Response
	Letters		Meetings	
	April 1, 2011 ¹	March 2/ April 4, 2012 ²		
Confederate Tribes of the Goshute Indian Reservations	✓	✓		In an email message on March 9, 2012, the tribe deferred to the Ute Indian Tribe of the Uintah and Ouray Reservation to represent their interests and concerns regarding the Project during consultation with the Bureau of Land Management (BLM).
Eastern Shoshone Tribe of the Wind River Reservation	✓	✓		In a letter dated July 5, 2011, the tribe responded to the April 1 letter indicating they intend to participate in government-to-government consultation for the Project.
Hopi Tribe	✓	✓		In a letter dated March 20, 2012, the tribe responded to the March 2 letter that they intend to participate in consultation under Section 106 of the National Historic Preservation Act. In a letter dated April 25, 2011, the tribe responded they intend to participate in government-to-government consultation for the Project.
Jicarilla Apache Tribe	✓	✓		No response
Navajo Nation	✓	✓		No response
Northern Arapaho Tribe of the Wind River Reservation	✓	✓		No response
Northwestern Band of the Shoshone Nation	✓	✓		No response
Paiute Indian Tribe of Utah	✓	✓		No response
Pueblo of Acoma	✓	✓		No response
Pueblo of Cochiti	✓	✓		No response
Pueblo of Isleta	✓	✓		No response
Pueblo of Jemez	✓	✓		No response

**TABLE 6-2
TRIBAL CONTACTS AND CONSULTATION**

Tribe	Type of Contact			Response
	Letters		Meetings	
	April 1, 2011 ¹	March 2/ April 4, 2012 ²		
Pueblo of Laguna	✓	✓		In a letter dated April 12, 2011, the tribe responded to the April 1, 2011, letter that they had no objection to the Project at that time.
Pueblo of Nambe	✓	✓		No response
Pueblo of Picuris	✓	✓		No response
Pueblo of Pojoaque	✓	✓		No response
Pueblo of San Felipe	✓	✓		No response
Pueblo of San Ildefonso	✓	✓		No response
Pueblo of San Juan	✓	✓		No response
Pueblo of Sandia	✓	✓		No response
Pueblo of Santa Ana	✓	✓		No response
Pueblo of Santa Clara	✓	✓		In a letter dated March 28, 2012, the tribe responded to the March 2 letter that they intend to participate in consultation under Section 106 of the National Historic Preservation Act
Pueblo of Santo Domingo	✓	✓		No response
Pueblo of Taos	✓	✓		No response
Pueblo of Tesuque	✓	✓		No response
Pueblo of Zia	✓	✓		No response
Pueblo of Zuni	✓	✓		No response
San Juan Southern Paiute Tribe	✓	✓		No response
Shoshone-Bannock Tribes of the Fort Hall Reservation	✓	✓		No response
Skull Valley Band of Goshute Indians of Utah	✓	✓		No response
Southern Ute Indian Tribes of Southern Ute Reservation	✓	✓		No response
TriUte Association			May 31, 2012	The BLM was invited by the TriUte Association (i.e., Southern Ute Indian Tribes of Southern Ute Reservation, Ute

**TABLE 6-2
TRIBAL CONTACTS AND CONSULTATION**

Tribe	Type of Contact			Response
	Letters		Meetings	
	April 1, 2011 ¹	March 2/ April 4, 2012 ²		
				Tribe of the Uintah and Ouray Reservation, and the Ute Mountain Ute of the Ute Mountain Reservation) to give a presentation to introduce and discuss the Project.
Ute Indian Tribe of the Uintah and Ouray Reservation	✓	✓	April 23, 2012	In a letter dated January 27, 2012, the BLM offered to give a presentation to the Ute Tribe Business Council and to meet with the Director, Ute Tribe Cultural Rights and Protection. In response, a meeting was arranged for April 23, 2012, in Fort Duchesne with the Ute Tribe Energy & Minerals Department. In follow-up letters dated April 23 and September 3, 2013, the BLM wrote to the Director, Ute Tribe Energy & Minerals Department and Ute Tribal Chairman and Council, respectively, to summarize the outreach with the tribe to date, to invite the tribe’s participation as a cooperating agency, and to request a meeting or meetings with the Department, Ute Tribal Council and/or Ute Business Council. On May 28 and July 10, 2013, the BLM followed up with email messages to the Director, Ute Tribe Cultural Rights and Protection requesting a meeting to discuss consultation and the Section 106 draft Programmatic Agreement, and inviting participation in a Consulting Parties meeting to review and discuss the draft Programmatic Agreement.

**TABLE 6-2
TRIBAL CONTACTS AND CONSULTATION**

Tribe	Type of Contact			Response
	Letters		Meetings	
	April 1, 2011 ¹	March 2/ April 4, 2012 ²		
Ute Mountain Ute of the Ute Mountain Reservation	✓	✓		In a letter dated May 3, 2011, the tribe responded to the April 1, 2011, letter that they intend to participate in government-to-government consultation for the Project.
NOTES: ¹ The BLM sent a letter to the tribes to introduce the Project, explain the preparation of the environmental impact statement, and request government-to-government consultation. ² By way of the March 2, 2012 letter, the BLM invited the tribes to participate in consultation under Section 106 of the National Historic Preservation Act and invited them to participate in a meeting to discuss preparation of the Programmatic Agreement. In the April 4, 2012 letter, the date of and background information for the meeting (on April 11, 2012), was provided.				

6.3 Scoping Process

The scoping process is purposefully conducted early in the EIS and land-use planning process and is open to all interested agencies and public. The intent is to solicit comments and identify issues that help direct the approach and depth of the environmental studies and analysis needed to prepare the EIS. Objectives to meet this goal include the following:

- Identify and invite agencies with jurisdiction and/or special expertise relevant to the Project to participate in the preparation of the EIS as cooperating agencies
- Identify other interested parties and invite them to participate in the NEPA process
- Identify other environmental review and consultation requirements
- Identify the relevant and substantive issues that need to be addressed during the studies and in the EIS
- Determine the range of alternatives to be evaluated
- Develop the environmental analysis criteria and systematic process, allocating EIS assignments among agencies, as appropriate

The scoping process is summarized in this section and documented in the *Energy Gateway South Transmission Project EIS Scoping Report* (BLM 2011a), which is available for viewing at the BLM field offices and on the BLM Project website (refer to the following section for its address). The issues derived from scoping comments are listed in Chapter 1, Table 1-1.

6.3.1 Approach

The range of issues summarized in this document was derived from the scoping process and ongoing public involvement. Some of the activities implemented early in the Project are listed below.

- Agency, interagency, and stakeholder meetings (listed in Appendix C) were held to discuss the Project and to solicit comments.
- Announcements to inform the public of the Project, EIS preparation, and public scoping meetings included the *Federal Register* NOI (April 1, 2011), and media releases to local newspapers and radio stations, legal notices, and the Environmental Notification Bulletin Board (ENBB, posted March 2011) .
- A newsletter was distributed to interested parties on the Project mailing list, which includes federal, state, and local government agencies, special interest groups, and individuals—a total of approximately 15,400 parties. The newsletter introduced the Project, solicited input for the environmental analysis, and announced upcoming public scoping meetings.
- The BLM-established Project website contains a brief description of the Project, the purpose of and need for the Project, an EIS timeline, the Draft EIS, newsletters, right-of-way information, geotechnical investigations, scoping reports, maps, and a schedule. A link was provided for the public to submit comments via email at BLM_WY-GatewaySouth@blm.gov. (http://www.blm.gov/wy/st/en/info/NEPA/documents/hdd/gateway_south.html)
- 12 formal scoping meetings were held in May and early June 2011, to introduce the Project, explain the purpose of and need for the Project, describe the Project, explain the planning and permitting process, and solicit comments useful for the environmental analysis.

In addition, the Applicant assembled four community working groups representing diverse interests associated with the Project area. To date, each CWG has met one time to provide input to the Applicant on the Project.

6.3.1.1 Information Dissemination and Notification

Mailing lists maintained by the BLM Rawlins, Rock Springs, Grand Junction, Little Snake, White River, Glenwood Springs, Cedar City, Fillmore, Moab, Price, Salt Lake, Vernal, Richfield Field Offices; and the Ashley, Manti-La Sal, Uinta-Wasatch-Cache, Medicine Bow-Routt, and White River National Forests were compiled along with a list of federal, state, and local agency representatives, community leaders, and potential stakeholders. Ranchers with grazing allotments on lands administered by the BLM and/or USFS and current BLM lease holders, whose contact information was extracted from the LR 2000 database, also were added to the Project mailing list. Other additions included interested organizations and individuals who commented on the Project or requested information. The mailing list is used to distribute scoping announcements and subsequent updates on the status of the Project.

As explained in Section 6.2, information about the Project was disseminated early in the NEPA process through the *Federal Register*, a newsletter, media releases and advertisements, and website postings.

A NOI was published in the *Federal Register* on April 1, 2011 (Vol. 76, No. 63, pages 18241 to 18243), announcing the preparation of the EIS for the proposed Project, and the opportunity for the public to participate in the process and provide input. The publication of the NOI in the *Federal Register* marked the beginning of EIS preparation and the scoping process.

The first in a series of newsletters was mailed by the BLM in March 2011, to approximately 8,100 individuals, agencies, and interested organizations on the Project mailing list. In addition, the Applicant prepared a list of the landowners within a 2-mile-wide corridor along the alternative routes (1 mile on either side of the reference centerline and approximately 7,300 landowners), sent a letter introducing the Project, and encouraged the landowners to participate in the federal scoping process. Media releases and newspaper notices were placed in regional and local newspapers (Table 6-3). Also, the BLM posted Project information and announcement of the meetings on the BLM public website and on the ENBB in mid-March 2011.

**TABLE 6-3
PRESS RELEASES AND LEGAL NOTICES**

Newspaper	Legal Notice Publication Dates
<i>Mt. Pleasant Pyramid, Sanpete County, Utah</i>	May 19 and 26, 2011
<i>The Moab Times-Independent, Moab, UT</i>	May 19 and 26, 2011
<i>The Times-News, Nephi, Utah</i>	May 11 and 18, 2011
<i>Sun Advocate, Price, Utah</i>	May 17 and 24, 2011
<i>Sanpete Messenger, Sanpete County, Utah</i>	May 11, 18, and 25, 2011
<i>Uintah Basin Standard, Roosevelt, Utah</i>	May 10 and 17, 2011
<i>Vernal Express, Vernal, Utah</i>	May 11 and 18, 2011
<i>Craig Daily Press, Craig, Colorado</i>	May 4 and 11, 2011
<i>Grand Junction Free Press, Grand Junction, Colorado</i>	May 6 and 13, 2011
<i>The Daily Sentinel, Grand Junction, Colorado</i>	May 4 and 11, 2011
<i>Rio Blanco Herald Times, Rio Blanco County, Colorado</i>	May 5 and 12, 2011
<i>The Citizen Telegram, Rifle, Colorado</i>	May 5 and 12, 2011
<i>Emery County Progress, Emery County, Utah</i>	May 17 and 24, 2011
<i>Laramie Boomerang, Laramie, Wyoming</i>	April 26 and May 3, 2011
<i>Rawlins Daily Times, Rawlins Wyoming</i>	April 26 and May 3, 2011
<i>The Rocket-Miner, Rock Springs, Wyoming</i>	April 27 and May 4, 2011
<i>Saratoga Sun, Carbon County, Wyoming</i>	April 27 and May 4, 2011
<i>Snake River Press, Baggs, Wyoming</i>	April 15 and 29, 2011

Scoping Meetings

Twelve scoping meetings were held in May and early June 2011 to inform the public about the Project and the NEPA process and to solicit input on the scope of the Project and potential issues. The scoping meetings were held from 4:30 to 7:30 p.m. at the locations and dates listed below:

Baggs, Wyoming
Tuesday, May 10, 2011

Roosevelt, Utah
Tuesday, May 24, 2011

Rock Spring, Wyoming
Wednesday, May 11, 2011

Fort Duchesne, Utah
Wednesday, May 25, 2011

Rawlins, Wyoming
Thursday, May 12, 2011

Nephi, Utah
Thursday, May 26, 2011

Craig, Colorado
Tuesday, May 17, 2011

Price, Utah
Tuesday, May 31, 2011

Rangely, Colorado
Wednesday, May 18, 2011

Mount Pleasant, Utah
Wednesday, June 1, 2011

Grand Junction, Colorado
Thursday, May 19, 2011

Green River, Utah
Thursday, June 2, 2011

An open-house format was used for the meetings. Handouts at the meetings included a Project map, the initial newsletter, and comment form. Several information display stations were positioned around the meeting room to help explain the purpose of and need for the Project, Project description (including Project maps), environmental studies and analyses to be completed, NEPA process timeline, cooperating agencies, how to submit comments, and scoping meeting dates and locations. One station in the meeting room was equipped with an automated, 3-dimensional “virtual tour” of the alternative routes. Those individuals interested could view the virtual tour along one or more of the alternative routes. Another station was attended by the Applicant’s realty agents who were able to answer landowner questions about the location of the alternative routes in relation to their properties. Another station was equipped with two computers loaded with the form developed to document comments from individuals. Representatives from the BLM, the Applicant, and the third-party environmental consulting team assisting the BLM, EPG, were present and available to explain the displays, answer questions, and assist in accepting and recording comments. A total of 231 members of the public attended the scoping meetings.

Written comments were accepted at the public scoping meetings, via electronic mail, and via U.S. mail at the BLM Wyoming State Office. Although the publication of the NOI initiated a 90-day public scoping period, scoping comments were accepted until June 30, 2011, 28 days after the last public scoping meeting.

6.3.2 Scoping Results

The public scoping process and results of scoping efforts are documented in the *Energy Gateway South Transmission Project EIS Scoping Report* (BLM 2011a), which is available for viewing on the BLM Project website. Availability of the Scoping Report was announced through the second in a series of newsletters sent to all parties on the Project mailing list and on the BLM Project website. A summary of the issues derived from comments received are listed in Chapter 1, Table 1-1.

6.3.3 Public Review of the Environmental Impact Statement and Land-use Plan Amendments

The BLM announced the availability of this Draft EIS and LUPAs for review and comment through a BLM *Federal Register* NOA, press releases, newspaper notices, Project newsletters, and the BLM Project website. Also, a newsletter announcing the availability of the Draft EIS was sent to parties on the Project mailing list. The EPA NOA in the *Federal Register* marks the beginning of the 90-day review and comment period. The Draft EIS and LUPAs was posted on the Project website and electronic copies were produced on CD-ROM for distribution. The Draft EIS and LUPAs has been distributed to agencies required to review the Draft EIS and LUPAs, and to other agencies, organizations, and individuals that requested copies.

During the 90-day review and comment period, 11 public meetings will be held for the BLM to receive comments on the adequacy of the Draft EIS and LUPAs. The meetings will be held in Baggs, and Rawlins, Wyoming, Craig, Rangely, and Grand Junction, Colorado, and Roosevelt, Fort Duchesne, Nephi, Price, Mount Pleasant, and Green River, Utah. The meetings will be conducted to provide ample opportunity for the public to comment on the Draft EIS and LUPAs. Dates and addresses of the public meetings will be announced through a Project newsletter, through local and news media, and listed on the Project website: http://www.blm.gov/wy/st/en/info/NEPA/documents/hdd/gateway_south.html at least 15 days in advance of the meetings.

All written comments must be received within 90 days after the NOA was published by the EPA in the *Federal Register*. Comments on the Draft EIS and LUPAs may be submitted verbally or in writing at the scheduled public open house meetings or in writing by letter or electronic mail to the BLM (as instructed in the letter to the readers at the beginning of this document).

Comments, including names and street addresses of respondents, will be available for public review at the BLM, Wyoming State Office, 5353 Yellowstone Road, Cheyenne, Wyoming, during regular business hours (7:45 a.m. to 4:30 p.m.), Monday through Friday, except holidays and may be published as part of the Final EIS.

Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment(s). Such requests will be honored to the extent allowable by law.

All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety. The BLM will not consider anonymous comments.

6.3.4 Final Environmental Impact Statement and Land-use Plan Amendments

All written and oral comments on the Draft EIS and LUPAs received during the 90-day period will be compiled and analyzed, and responses will be prepared for inclusion in the Final EIS and Proposed LUPAs. A *Federal Register* NOA of the Final EIS and Proposed LUPAs will be published, which will contain information about the Project and the 30-day availability period for the Final EIS and concurrent 30-day protest period for the Proposed LUPAs and filing instructions. Also, the BLM will provide a 60-day review period to the Governors of the states in which LUPAs are being proposed to ensure consistency with state and local plans, policies, and programs. The availability and protest periods and Governors' consistency review will occur simultaneously. Any responses from a Governor on consistency must be resolved before RODs are issued.

The BLM and USFS will each issue a ROD and other affected federal agencies with decisions to make may each issue a ROD summarizing the findings and decisions regarding the preferred alternative for the Proposed Action and its determination regarding compliance with NEPA and other regulations. Also, the RODs will document the management decisions made regarding applicable amendments to land-use plans.

6.4 Applicant-initiated Activities

Four community working groups, created to provide a forum for input into the transmission line siting studies, consisted of representatives from cities, counties, and stakeholders in the northern and southern portions of the Project area. While the community working groups are not decision-making entities, members were asked to provide feedback on the Project and consider the views of the group, as well as the views of their respective organizations and/or communities. To date, the community working groups have each met one time. The first meetings were held in September 2012 in Rawlins, Wyoming; and Salt Lake City, Nephi, and Price, Utah. The purpose was to (1) introduce the proposed Project, (2) gather input regarding the scope of the Project and alternative routes, and (3) identify issues that would help the Applicant in developing the transmission line. The Applicant anticipates another set of meetings will be conducted after the Draft EIS and LUPAs is issued for review and comment.

In addition, the Applicant posted a general description of the Project on their communications website (www.pacificorp.com/transmission) and conducted briefings of community leaders to introduce and continue to keep them informed about the Project. A list of additional community outreach meetings is included in Appendix C.

In addition, the Applicant will continue to provide updates and information regarding the Project to all the counties and cities that require conditional use permits and general plan amendments.

6.5 Preparers and Contributors

Preparers, contributors, and consultants involved throughout the Project (including BLM and USFS staff), are listed in Tables 6-4, 6-5, and 6-6.

TABLE 6-4		
BUREAU OF LAND MANAGEMENT PREPARERS AND CONTRIBUTORS		
Name	Title	Involvement
Bureau of Land Management		
Project Management		
Tamara Gertsch	National Project Manager	Project management and coordination
Scott Whitesides		National Transmission Support Team (NTST) National Environmental Policy Act (NEPA) Support
Christine Pontarolo	Biologist	NTST Biological Resources Support
Jenna Gaston	Cultural Resources Specialist	NTST Cultural Resources Support
Beverly Gorny	Public Affairs Specialist Project Assistant	Public affairs
Tamera Hammack	Web Specialist	Website maintenance
Wyoming		
Wyoming State Office		
Brent Breithaupt	Regional Paleontologist	Paleontological resources
Ranel Capron	State Archaeologist Project Lead – Cultural Resources	Cultural resources
Christopher Carlton	Planning and NEPA	NEPA compliance review
Sherry Lahti	State Program Lead – Visual Resource Management	Visual resources
Pamela Murdock	Branch Chief, Planning and Environmental Coordination	NEPA and planning support
Dennis Saville	Project Lead – Wildlife	Wildlife resources
Janelle Wrigley	State Program Lead – Realty	Project management, lands, access
Mary Wilson	Chief, Office of Communications	State Project Lead, external communications
Rawlins Field Office		
Ron Biegel	Realty Specialist	Lands and realty
Frank Blomquist	Wildlife Biologist Project Lead – Wildlife	Wildlife resources
Bonni Bruce	Supervisory Archaeologist State Project Lead – Cultural Resources	Cultural resources
Mike Calton	Range Management Specialist	Wild horses and burros
Dennis Carpenter	Field Manager	
Robert Epp	Range Management Specialist	Livestock grazing
Bruce Estvold	Civil Engineer	
Susan Foley	Soil Scientist	Earth resources, vegetation

TABLE 6-4		
BUREAU OF LAND MANAGEMENT PREPARERS AND CONTRIBUTORS		
Name	Title	Involvement
Martha Hemphill	Archaeologist	Cultural resources
David Hullum	Outdoor Recreation Planner	Recreation, visual resources
Lynn McCarthy	Geographic Information System (GIS) Specialist	GIS
Mark Newman	Geologist	Earth resources
Kelly Owens	Hydrologist	Water resources
Richard Putnam	Fire/Fuels Specialist	Fire/Fuels
John Russell	RECO Project Manager	
Heather Schultz	RECO Project Manager	Field Office Point of Contact, lands and realty
Colorado		
Colorado State Office		
Maryanne Kurtinaitis	Renewable Energy program Manager	State Point of Contact
Northwest District Office		
Jim Cagney	Northwest District Manager	
David Rosenkrance	Associate District Manager	
Grand Junction Field Office		
Doug Diekman	Information Technology (IT) Specialist	GIS
Jim Dollerschell	Rangeland Management Specialist	Range, wild horses
Collin Ewing	Planning and NEPA Specialist	NEPA and planning support
Scott Gerwe	Geologist	Minerals, paleontology, groundwater
Lathan Johnson	Fire/Fuels Specialist	Fire/Fuels
Erin Dreyfuss Jones	NEPA Coordinator	Field Office Point of Contact
Alyssa A. Levitt-Reynolds	Archaeologist	Cultural resources
Anna Lincoln	Ecologist	Range, threatened and endangered plants
Heidi Plank	Wildlife Biologist	Wildlife, threatened and endangered wildlife
Christina Stark	Natural Resource Specialist	Lands and realty
Katie Stevens	Field Manager	
Mark Taber	Natural Resource Specialist	Weeds
Cathy Ventling	Natural Resource Specialist	Natural resources
Little Snake Field Office		
Desa Ausmus	State Project Lead – Wildlife	Wildlife
Pam Levitt	IT Specialist (GIS)	GIS
Kathy McKinstry	Environmental Coordinator	NEPA and planning support
Louise McMinn	Realty Specialist	Field Office Point of Contact, lands and realty
Jimmy Michels	Fire/Fuels Specialist	Fire/Fuels
Wendy Reynolds	Field Manager	
Gina Robison	Outdoor Recreation Planner	Recreation, travel management, visual resource management, wilderness
Kim Ryan	Archaeologist	Cultural resources
Hunter Seim	Lead Rangeland Management Specialist	Range
Emily Spencer	Ecologist	Soil, water, air
White River Field Office		
Lisa Belmonte	Wildlife Biologist	Wildlife, threatened and endangered animals, riparian
Richard Brooks	IT Specialist	GIS

TABLE 6-4 BUREAU OF LAND MANAGEMENT PREPARERS AND CONTRIBUTORS		
Name	Title	Involvement
Janet Doll	Realty Specialist	Field Office Point of Contact, lands and realty
Matt Dupire	Rangeland Management Specialist	Range, vegetation, noxious weeds
Baili Foster	Seasonal Ecologist	Special designation and other management areas
Melissa Kindall	Range Technician	Wild horse
Bob Lange	Hydrologist	Soil, water, air
Ester McCullough	Associate Field Manager	
Jimmy Michels	Fire/Fuels Specialist	Fire/Fuels
Heather Sauls	Planning and Environmental Coordinator	NEPA and planning support
Chad Schneckenburger	Outdoor Recreation Planner	Recreation, visual resource management, travel management
Michael Selle	Archaeologist	Cultural resources, paleontology
Kent Walter	Field Manager	
Heather Woodruff	Range Management Specialist	Special status plants
Utah		
Utah State Office		
Lola Bird	External affairs	
Shauna Derbyshire	Realty Specialist	State Project Lead, lands and realty
Carla Garrison	IT Specialist	GIS
Jeremy Jarnecke	Hydrologist	Hydrology
Pamela Jarnecke	Branch Chief, Planning and Environmental Coordination	Project Lead, NEPA and planning support
Byron Loosle	Archaeologist State Project Lead – Cultural Resources	Cultural resources
Whitney May	Visual Resource Management Specialist	Visual resources
Robin Naeve	Biologist	State Project Lead, wildlife
Jeremy Sisneros	Fire/Fuels Specialist	Fire/Fuels
Rob Sweeten	Landscape Architect Visual Resource Management Specialist, National Scenic and Historic Trails	State Project Lead, visual resources, National Scenic and Historic Trails
Color Country District		
Todd Christensen	District Manager	
Randy Trujillo	Associate District Manager	
West Desert District		
Kevin Oliver	District Manager	
David Whitaker	Emergency Stabilization and Reclamation Coordinator	Vegetation, threatened and endangered plants
Fillmore Field Office		
Gary Bishop	Assistant Fire Management Officer	Fire prevention
Steven Bonar	Outdoor Recreation Planner	Recreation, areas of critical environmental concern (ACECs), wilderness
Paul Caso	Rangeland Management Specialist	Air quality, range, floodplains, water rights, water quality
Michael Gates	Field Manager	
Chad Kunz		Roads, facilities

TABLE 6-4 BUREAU OF LAND MANAGEMENT PREPARERS AND CONTRIBUTORS		
Name	Title	Involvement
Cindy Ledbetter	Environmental Coordinator	
Jerry Mansfield	Geologist	Paleontology, minerals, energy resources
Joelle McCarthy	Assistant Field Manager Non-Renewables, Archaeologist	
R.B. Probert	Bio Science Tech (Plants)	Range, weeds
Eric Reid	Assistant Field Manager Renewables	Renewables
Clara Stevens	Realty Specialist	Field Office Point of Contact, lands and realty
Russell Tanner	Archaeologist	Cultural resources, tribal consultation, historic trails
Bill Thompson	Rangeland Management Specialist	Wetlands, riparian, farmlands, vegetation
Moab Field Office		
Ann Marie Aubry	Hydrologist	Hydrology, riparian areas
Jean Carson	GIS Specialist	GIS
Jordan Davis	Rangeland Management Specialist	Weeds
Jan Denney	Realty Specialist	Field Office Point of Contact, lands and realty
Rebecca Doolittle	Geologist	Geology, minerals, soils
Aron King	Archaeologist	Cultural resources, tribal consultation
Don Montoya	Archaeologist	Cultural resources, tribal consultation
Pam Riddle	Wildlife Biologist	Wildlife, special status species
Bill Stevens	Outdoor Recreation Planner	Wilderness, WSR, socioeconomics
Katie Stevens	Outdoor Recreation Planner	Recreation, ACECs
Doug Wight	GIS Specialist	GIS
David Williams	Range Management Specialist	Range
Price Field Office		
Patricia Clabaugh	Field Manager	
Karl Ivory	Rangeland Management Specialist	NRS, threatened and endangered plants
Floyd Johnson	Planner	NEPA and planning
Amber Koski	Archaeologist	Cultural resources
Don Kranendonk	Assistant Field Manager	
Connie Leschin	Realty Specialist	Field Office Point of Contact, lands and realty
Ahmed Mohsen	Associate Field Manager	NEPA and planning
Tyler Nelson	GIS Specialist	GIS
Jared Reese	Natural Resource Specialist	Wildlife biology
Richfield Field Office		
Jason Anderson	GIS Specialist	
Stan Anderson	Field Manager	
Dona Bastian		Wild horses
Bob Bate		Forestry, fire
Chris Colton	Assistant Field Manager, Range	
Jennifer Evans	Outdoor Recreation Planner	Recreation, visual resource management, ACECs, wilderness, wild and scenic rivers, natural areas
Larry Greenwood	Wildlife Biologist	Wildlife, special status species
Myron Jeffs	Outdoor Recreation Planner	Recreation, visual resource management, ACECs, wilderness, wild and scenic rivers, natural areas

TABLE 6-4		
BUREAU OF LAND MANAGEMENT PREPARERS AND CONTRIBUTORS		
Name	Title	Involvement
Joe Manning	Geologist	Geology, paleontology
Michael Utley	Realty Specialist	Field Office Point of Contact, lands and realty
Wayne Wetzel	Field Manager	
Burke Williams	Natural Resource Specialist	Weeds, range
Phil Zieg	Soil Conservationist	Air, water quality
Salt Lake Field Office		
Traci Allen	Biologist	
Mike Nelson	Field Manager, Realty Specialist	Lands and realty
Pam Schuller	Environmental Coordinator	
Dave Watson	Realty Specialist	Field Office Point of Contact, lands and realty
Vernal Field Office		
Cameron Cox	Archaeologist	Cultural resources
Daniel Emmett	Biologist	State Project Lead – Wildlife
Elizabeth Gamber	Geologist	Paleontology
Robin Hansen	Petroleum Engineer	Minerals, energy resources
James Hereford	Natural Resource Specialist Environmental Scientist	
Stephanie Howard	NEPA Specialist	NEPA and planning
Jerry Kenczka	Assistant Field Manager Minerals	
Maggie Martson	Range Management Specialist	Range management
Cindy McKee	Realty Specialist	Field Office Point of Contact, lands and realty
Stan Olmstead		Range, water quality
David Palmer	Forester	Forestry
Aaron Roe	Botanist	Botany, weeds, and vegetation
Michael Stiewig	Field Manager	
Steve Strong	Natural Resource Specialist	Soils
Jason West	Natural Resource Specialist	Recreation, visual resource management, wilderness, ACECs, wild and scenic rivers
Bureau of Land Management National Operations Center		
David Maxwell	Air quality Specialist	Air quality support
Karla Rogers	Visual Resource Management	Visual resources support
Josh Sidon	Socioeconomist	Social and economic conditions support
U.S. Department of the Interior Office of Environmental Policy and Compliance		
David Sire	Regional Environmental Officer	NEPA
Robert Stewart	Regional Environmental Officer	NEPA
Lisa Treichel	Regional Environmental Officer	NEPA

**TABLE 6-5
U.S. FOREST SERVICE PREPARERS AND CONTRIBUTORS**

Name	Title	Involvement
Kelsha Anderson	Soil Scientist	Soils
Scott Bingham	Ashley National Forest	Point of Contact (Forest)
Kenton Call	Project Lead	Project management
Joe DiBenedetto	Paleontologist	Paleontology
Kevin Draper	Landscape Architect	Visual resources
Rick Dustin	Landscape Architect	Visual resources
Mike Fracasso	Paleontologist	Paleontology
Anne Hansen	Uinta-Wasatch-Cache National Forest	Project Point of Contact (Forest)
Melissa Hearst	Intermountain Region	Project Point of Contact (Region)
Chad Hermandorfer	Hydrologist (TEAMS)	Water resources
Marian Jacklin	Archaeologist	Cultural resources
Jenna Jorgensen	Wildlife Biologist	
Nate Lewis	Environmental Coordinator	Recreation, lands, special uses, and roadless areas
Tom Lloyd	Manti-La Sal National Forest	Project Point of Contact (Forest)
Chris Mease	Fisheries Biologist (TEAMS)	Fisheries
Tim Metzger	Fire Specialist (AMSET)	Fire/Fuels
Terry Miller	Botanist (TEAMS)	Plants
Andrew Orlemann	Silviculturalist (TEAMS)	Forestry
Cheryl Probert	Deputy Forest Supervisor, Uinta-Wasatch-Cache national Forest	Forest Service Authorized Officer
David Ream	Intermountain Region	Project Point of Contact (Region)
Charlie Rosier	Recreation Specialist	Recreation, lands, and special uses
Lucretia Smith	GIS Coordinator, Range Specialist (TEAMS)	GIS, range
Stacey Weems	Soil Scientist	Soils
Josh Wilson	NEPA Specialist (AMSET)	NEPA and planning support

**TABLE 6-6
CONSULTANT PREPARERS AND CONTRIBUTORS**

Name	Education	Involvement
Environmental Planning Group (EPG)		
Ryan Baum	MS, Geographic Information Sciences BS, Biology	Geographic Information Systems
Timothy G. Baumann, CWB	MS, Wildlife Biology BS, Biology	Vegetation resources, special status plants, wildlife, special status wildlife, and fish and aquatic resources
Louise Brown	BS, Administrative Systems	Document management, editor
Suzy Cavanagh	MS, Geology BS, Biology	Earth resources and paleontological resources
Jennifer Streeter	MS, Geography BS, Geography	Geographic Information Systems
John Curl	BS, Public Lands Policy	Biological resources, supporting information
Brian Doubek	BS, Earth Science (Geography)	Geographic Information Systems
Michael Doyle	MLA, Landscape Architecture BS, Environmental Design	Principal-in-charge, technical review

TABLE 6-6 CONSULTANT PREPARERS AND CONTRIBUTORS		
Name	Education	Involvement
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Nate Ferguson	BLA, Landscape Architecture and Environmental Planning	Visual resources and environmental planning
Naia George	MS, Anthropology BS, Anthropology	Cultural and historical resources
Lynne Gilbert-Norton, PhD	PhD, Wildlife Biology MS, Psychology – Animal Behavior BS, Psychology	Wildlife resources
Gena Huffman	MS, Anthropology BA, Political Science and Anthropology	Cultural and historical resources
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Jonathan Knight	BS, Geography	Geographic Information Systems
Mike McConnell	BS, Wildlife Resources	Water resources, fish and aquatic resources
Sarah Nelson	MLA, Landscape Architecture and Environmental Planning BA, Anthropology	Geographic Information System
Amanda O'Connor	MS, Conservation Studies BA, Environmental Biology	Senior technical review, NEPA and planning coordination
Mike Pasenko	MS, Quaternary Sciences Program BA, Anthropology	Earth and water resources, paleontology
Mary Pendergast, PhD	PhD, Ecology and Biology BS, Chemistry and Biology	Special status wildlife resources
Reid Persing	BA, Chemistry and Biochemistry	Vegetation and special status plant resources
Scott Peters	BLA, Landscape Architecture	Access roads and disturbance
Kevin Rauhe	BLA, Landscape Architecture	Visual resources
Matt Sauter	MS, Paleontology BA, Geology	Earth and water resources, paleontology
Marc Schwartz	BS, Forestry/Ecosystem Management	Visual resources
Chris Smith	BA, History MLA, Landscape Architecture	Project coordination
Cindy Smith	BS, Liberal Arts and Sciences	Project management
Linwood Smith	PhD, Zoology MS, Zoology BA, Zoology	Wildlife biology and vegetation resources
Danielle Stevens	BA, English BS, Environmental Science	Technical editor
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Marty Thomas	BA, English BA, Anthropology	Cultural and historical resources
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Heather Weymouth	MS, American Studies (Anthropology) BIS, Anthropology	Cultural and historical resources

TABLE 6-6 CONSULTANT PREPARERS AND CONTRIBUTORS		
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Andrew T. Yentsch	MS, Anthropology (Archaeology/Human Evolutionary Ecology) BA, History	Cultural and historical resources
Subconsultants		
Louis Berger Group		
Holly Bender	PhD, Mineral Economics MS, Mineral Economics BA, Political Science and Economics	Socioeconomics and environmental justice
Lisa McDonald	PhD, Mineral Economics MS, Mineral Economics BS, Earth Science	Socioeconomics and environmental justice
Wind River Environmental Group, LLC		
Martha Hyder, PhD	PhD, Earth Science/Bioclimateology MS, Earth Science/Bioclimateology BS, Biology	Air quality and Clean Water Act conformity analysis
Exponent		
William H. Bailey	PhD, Neuropsychology	Electric and Magnetic Fields
Joshua Phinney	PhD, Electrical Engineering SM, Electrical Engineering BS, Electrical Engineering BA, Ancient and Classical Languages, Philosophy	Electric and magnetic fields, noise

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GLOSSARY

A

A.D. – Anno Domini. Dating system devised in 525 to enumerate the years used with the Julian and Gregorian calendars, which are based on the traditionally reckoned year of the birth of Jesus of Nazareth.

A-Weighted Sound Level – Sound that is measured with a sound-level meter using the A-weighted response filter built into the meter circuitry. The A-weighted filter simulates the frequency response to the human ear.

Access (road) – Road used for passage to and along transmission line for purposes of construction and maintenance.

Active Lek – Any lek that has been attended by male greater sage-grouse during the strutting season. Presence can be documented by observing birds using the site or by signs of strutting activity.

Active Raptor Nest Site – Any identified raptor nest site that could provide a nesting opportunity for a raptor. Temporal and spatial stipulation will be applied.

Advisory Council on Historic Preservation (ACHP) – An independent federal agency that advises the President and Congress on historic preservation matters and oversees the review of projects under Section 106 of the National Historic Preservation Act.

Affected Environment – (1) A geographic area and the associated natural, human, and cultural resources that could be influenced by a proposed action. (2) The chapter in an environmental impact statement (EIS) that describes the existing condition of the environment.

Agency Interdisciplinary Team – A group of individuals with different training, representing the physical sciences, social sciences, and environmental design arts, assembled to solve a problem or perform a task. The members of the team proceed to a solution with frequent interaction so that each discipline can provide insights on any stage of the problem and disciplines can combine to provide new solutions. Also Interdisciplinary Team.

Aggregate – A group or mass of distinct things gathered into, or considered as, a total or a whole.

Albedo – A measure of a material's ability to reflect sunlight (including the visible, infrared, and ultraviolet wavelengths) on a scale of 0 to 1. An albedo value of 0.0 indicates the surface absorbs all solar radiation, and a 1.0 albedo value represents total reflectivity. The *ENERGY STAR Reflective Roof Products* criteria specify an albedo of 0.65 or higher for low-slope roof applications and 0.25 for sloped roofs.

Alignment – The specific, surveyed route of a transmission line.

All-terrain Vehicle (ATV) – A wheeled or tracked vehicle, other than a snowmobile or work vehicle, designed primarily for recreational use or for the transportation of property or equipment exclusively on undeveloped road rights-of-way, marshland, open country, or other unprepared surfaces.

Allotment – An area of land where one or more livestock operators graze their livestock. Allotments consist of BLM-administered land and usually include other federally managed, state-administered, and

private land. An allotment may include one or more pastures. Livestock numbers and periods of use are specified for each allotment.

Alluvium – A general term for clay, silt, sand, gravel, or similar consolidated material deposited during a comparatively recent geologic time by a stream or other body of running water in the bed of a stream, river, or floodplain, or as a cone or fan at the base of a mountain slope.

Alternating Current – The flow of electric charge periodically reverses direction. (In direct current [DC], the flow of electric charge is only in one direction.)

Alternative (action) – An option for meeting the stated need.

Alternative (route) – An optional path or direction for a transmission line.

Ambient Air – Any unconfined portion of the atmosphere: open air, surrounding air.

Amendment – The process for considering or making changes in the terms, conditions, and decisions of approved land-use plans using the prescribed provisions for resource management planning appropriate to the proposed action or circumstances.

American Indian Tribe – Any extant or historical tribe, band, nation, or other group or community of indigenous peoples in the United States that is federally recognized as eligible for special programs and services provided by the United States because of their status as Indians pursuant to the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450 et seq.). An Indian tribe, situated within the boundaries of a state, exercises the powers of government and sovereignty, under the national government.

Animal Unit Month (AUM) – A standardized unit of measurement of the amount of forage necessary for the sustenance of one animal unit for 1 month; also, a unit of measurement that represents the privilege of grazing one animal unit for 1 month. An animal unit is a standardized unit of measurement for range livestock or wildlife. Generally, one mature cow (1,000 pounds) or its equivalent, based on an average daily forage consumption of 26 pounds of dry matter per day.

Annual (ecology) – A plant that completes its development in one year or one season and then dies.

Appeal – A formal action requesting a decision be reviewed by a higher authority. For the BLM this usually means review by the Interior Board of Land Appeals (IBLA).

Anthropogenic – Caused or influenced by humans.

Aquifer – A stratum of permeable rock, sand, etc., that contains water. Water source for a well.

Archaeology – The science that investigates the history of peoples by studying the material remains of past societies.

Area of Critical Environmental Concern (ACEC) – A Bureau of Land Management (BLM) designation for an area within public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources or other natural systems or processes; or to protect life from natural hazards.

Artifact – Any object showing human workmanship or modification, especially from a prehistoric or historic culture.

Assessment (environment) – An evaluation of existing resources and potential impacts to those resources from a proposed act or change to the environment.

Attainment Area – An area considered to have air quality as good as or better than the National Ambient Air Quality Standards, as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a nonattainment area for others.

Authorized Officer – Any employee of the Department of the Interior to whom has been delegated the authority to perform the duties defined. Under the BLM standard delegation (Manual 1203), this is no lower than the Field Office or District Manager. Delegation below this level should be specific to an individual and a specific right-of-way project.

Avoidance (as it relates to mitigation) – Avoiding the impact altogether by not taking a certain action or parts of an action (40 CFR 1508.20) (e.g., also may include avoiding the impact by moving the proposed action to a different time or location.).

Avoidance Area – an area designated in a land use plan, for which use for a right-of-way should be avoided if at all possible.

B

B.P. – Before the present. As used in radiocarbon and other archaeological dating, the present is defined as A.D. 1950.

Background – The portion of the visual landscape lying from the outer limit of the middleground to infinity. Color and texture are subdued in this area, and visual sensitivity analysis is primarily concerned with the two-dimensional shape of landforms against the sky.

Background Concentrations – Background concentrations are an essential part of the total air quality concentration to be considered when determining source impacts. Background air quality includes pollutant concentrations due to (1) natural sources, (2) nearby sources other than those currently under consideration, and (3) unidentified sources.

Batch Plant – An area used for concrete mixing, temporary field office facility, material storage, and stations for equipment maintenance during construction of a transmission line. The area usually covers approximately 2 acres.

Board Feet – A lumber unit of measure. Each board foot is the volume of a 1-foot length of a board 1 foot wide and 1 inch thick.

Bowen Ratio – The ratio of energy available for sensible heating to energy available for latent heating.

Burial – Unmarked human interment or grave.

C

Cairn – A stack or mound of rocks used to mark the locations of boundaries or mining claims.

Candidate Species – Any species included in the *Federal Register*'s Notice of Review being considered for listing as threatened or endangered by the U.S. Fish and Wildlife Service.

Campsite – A site occupied by a limited number of individuals either seasonally or for short periods of time. Such a site is frequently characterized by the presence of limited activity areas, artifact scatters (e.g., lithic debitage, lithic tools, ground stone, and ceramics), thermal features or scatters of fire-cracked rock.

Capability – The ability to generate or transmit power.

Capacity – The load-carrying ability, expressed in megawatts (MW), of generation, transmission, or other electrical equipment.

Carbon Monoxide (CO) – A colorless, odorless, poisonous gas produced by incomplete fossil fuel combustion. One of the six criteria pollutants.

Casual Use – Activities ordinarily resulting in no or negligible disturbance of the public or federal land, resources, or improvements. Examples of casual use include surveying, marking routes, and collection data to use to prepare applications of grants or temporary-use permits.

Cenozoic – An era of geologic time from the beginning of the Tertiary period (65 million years ago) to the present.

Centerline – A line along the approximate middle of a transmission line right-of-way.

Circuit – A complete, closed conducting path over which electric current may flow.

Cist – A constructed/enclosed storage place that may be above, partially or completely underground and either lined or unlined

Clear and Restore – Vegetation is cropped (i.e., pruned back or cut to near ground level) within the overland access route and work areas. The clearing is done carefully so the root ball of the plants remains intact. Upon completion, ruts are repaired and reseeded as specified by the agencies or landowners.

Colluvium – Soil and rock detritus accumulated at the bottom of a slope.

Compensatory mitigation – Compensating for the impact by replacing or providing substitute resources or environments (40 CFR 1508.20).

Compensatory mitigation ecological durability – Benefits from compensatory mitigation projects on compensatory mitigation sites persisting and influencing the landscape for as long as or longer than the projected impacts will negatively affect greater sage-grouse.

Compensatory mitigation protective durability – Protection of compensatory mitigation sites from future and conflicting land uses or disturbances for as long as or longer than the projected impacts will negatively affect greater sage-grouse.

Compensatory mitigation reversals – Damage to functioning compensatory mitigation sites that may be caused by natural disturbances (unintentional reversal, such as wildfire) or anthropogenic disturbances (intentional reversal, such as development) that shorten the intended duration of compensatory mitigation.

Compensatory mitigation projects – Specific, on-the-ground actions (mitigation measures) to improve habitats (e.g., chemical vegetation treatments).

Compensatory mitigation sites – The durable areas where compensatory mitigation projects will occur.

Conductor – The wire cable strung between transmission line towers through which the electrical current flows.

Conformance – A proposed action must be provided for specifically in a land use plan or, if not specifically mentioned, must be clearly consistent with the terms, conditions, and decisions of the approved plan or plan amendment.

Constraint – Environmental or engineering conditions or management prescriptions for a specific area limiting or precluding access to or siting of structures or facilities (e.g., terrain, airports, utility exclusion areas, etc.).

Contrast – The effect of a striking difference in the form, line, color, or texture of an area being viewed.

Contrast Rating – A method of determining the extent of visual impact for an existing or proposed activity that would modify any landscape feature (land and water form, vegetation, and structures).

Corona – The discharge of energy from an energized transmission line that occurs when the voltage gradient exceeds the breakdown strength of air.

Cooperating Agency – Any agency that has special jurisdiction by law or special expertise for proposals covered by the National Environmental Policy Act (40 CFR 1501.6). Any federal, state, tribal, or local government jurisdiction with such qualifications may become a cooperating agency, by agreement with the lead agency, to assist the lead agency in developing an environmental assessment (EA) or EIS.

Corridor – A tract of land forming a passageway for linear utilities or transportation uses.

Council on Environmental Quality (CEQ) – An advisory council to the President of the United States established by the National Environmental Policy Act of 1969. This council reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

Counterpoise – Conductive cable buried in the ground at a transmission line tower to lower the resistance of the ground to conduct electricity.

Cretaceous – The final period of the Mesozoic era spanning the time between 145 and 65 million years ago.

Criteria Pollutant – The 1970 amendments to the Clean Air Act required the EPA to set National Ambient Air Quality Standards for certain pollutants known to be hazardous to human health. The EPA has identified and set standards to protect human health and welfare for six pollutants: ozone, carbon monoxide, total suspended particulates, sulfur dioxide, lead, and nitrogen oxide. The term “criteria pollutants” derives from the requirement that the EPA must describe the characteristics and potential health and welfare effects of these pollutants. It is on the basis of these criteria that standards are set or revised.

Critical Habitat – Any particular range or habitat component that is the determining factor in a population’s ability to maintain and reproduce at a certain level over the long term.

Crucial Winter Range – The portion of the winter range to which a wildlife species is confined during periods of heaviest snow cover.

Cultural Resource – Any resource associated with the human cultural environment; examples include artifacts and historic artifacts, archaeological sites, historic sites, ethnographic sites; historic properties, and traditional cultural properties.

Cultural Assemblage – The complete inventory of artifacts from a defined archaeological unit.

Cumulative Effect – The effect on the environment that results from the incremental impact of an action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7 and 1508.25). Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 Code of Federal Regulations [CFR] 1508.7).

Current (electric) – A flow of electrons in an electrical conductor. The strength or rate of movement of the electricity is measured in amperes.

D

Deadend Structure – Transmission line tower structures that are more robust than tangent structures, used (1) to add longitudinal strength to the line; (2) at turning points (angles); (3) for added safety at crossings of other utilities (e.g., other transmission lines and roads); and (4) to interrupt long distances of suspension structures that would otherwise provide more exposure to catastrophic line failure over long distances.

Debitage – The waste material produced during the production of chipped stone tools.

Decision-maker – The agency official who has been delegated authority to approve an action and is responsible for issuing a decision to implement a proposed action. Synonyms include authorized official, authorized officer, responsible official, and responsible manager.

Degradation – The wearing down, or away, and general lowering or reduction of the earth's surface by the processes of weathering and erosion.

Demand (electric) – The rate at which electric energy is delivered to or by a system, part of a system or piece of equipment, at a given instant or averaged over any designated period of time.

De minimis levels – The minimum threshold for which a conformity determination must be performed, for various criteria pollutants in various areas.

Dendroglyph – A design or motif carved with a sharp element into the trunk of living trees.

Design Features of the Proposed Action – Measures or procedures incorporated into the proposed action or an alternative, including measures or procedures that could reduce or avoid adverse impacts. Because these features are “built into” the proposed action or alternative, design features are not considered mitigation.

Designated Utility (or Right-of-way) Corridor – A parcel of land with specific boundaries identified by law, Secretarial order, the land-use planning process, or other management decision as being a preferred

location of existing and future rights-of-way. The corridor may be suitable to accommodate more than one type of right-of-way or one or more rights-of-way that are similar, identical, or compatible.

Direct Current – The flow of electric charge is only in one direction. (In alternative current [AC], the flow of electric charge periodically reverses direction.)

Direct Effect – Effects caused by the action (i.e., construction) and occur at the same time and place (40 CFR 1508.8(a)).

Discharge (water) – The rate of flow or volume of water flowing in a stream at a given location or within a given period of time.

Dispersed Recreation – Recreation activities of an unstructured type that are not confined to specific locations such as recreation sites. An example of these activities may be hunting, fishing, off-highway vehicle use, hiking, and sightseeing.

Distance Zone – A visibility threshold distance where visual perception changes. The zones are usually defined as foreground, middleground, and background.

Distributed Generation – A method of generating electricity from multiple small energy sources very near to where the electricity is actually used.

Distribution System – The portion of an electric system that is dedicated to delivering electric energy to an end user.

Diversity – The relative abundance or wildlife species, plant species, communities, habitat, or habitat features per unit of area.

Drive and Crush – Driving overland within a staked overland access route. The landscape is not altered other than compaction of soil under the vehicle tires/tracks, and the vegetation may be crushed but not cleared or uprooted.

Dump – A formal or informal concentration of historic trash, related to subsistence practices and containing single or multiple episodes of deposition.

E

Ecology – The relationship between living organisms and their environment.

Economic Base – An area's economic base comprises industries that are primarily responsible for bringing outside income into the local economy. Economic base analysis measures the relative importance of industries for a particular area by comparing employment and income levels to a reference area (e.g., the United States).

Ecosystem – A complex system composed of a community of plants and animals and includes the system's chemical and physical environment.

Effect – Impact on the human environment brought about by an agent of change or action. Effects analysis predicts the degree to which the environment will be affected by an action. The Council on Environmental Quality uses the terms "effect" and "impact" synonymously in the NEPA regulations.

Other synonyms include consequence, result, and outcome. Effects can be beneficial or detrimental, and may be direct, indirect, or cumulative.

Electric and Magnetic Field (EMF) – A space or region within which magnetic forces are present around an electrical current (also referred to as electromagnetic field).

Electric Field – Electric effect resulting from the voltage on a transmission line. Measured as volts per meter or kilovolts per meter.

Emergent (vegetation) – Vegetation with all or part of their vegetative and reproductive parts above the water.

Endangered Species – A plant or animal species whose prospects for survival and reproduction are in immediate jeopardy, as designated by the Secretary of the Interior. It is further defined by the Endangered Species Act of 1973, as amended.

Endemic – Plants or animals native to a particular region or country.

Environment – The surrounding conditions, influences, or forces that affect or modify an organism or an ecological community and ultimately determine its form and survival.

Environmental Impact Statement (EIS) – A detailed written statement, as required by Section 102(2)(C) of the National Environmental Policy Act, when an agency proposes a major federal action significantly affecting the quality of the human environment.

Environmental Justice – The pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, and/or socioeconomic status. Federal agencies must incorporate environmental justice as part of their mission by identifying and addressing the effects of programs, policies, and activities to ensure the opportunity for full and fair participation by affected communities in the decision-making process; and avoid, minimize, or mitigate disproportionately high and adverse health and environmental effects on minority and low-income populations.

Eocene – The epoch of the Tertiary period spanning the time between 56 and 33.9 million years ago.

Eolian – Wind-blown sand or silt material, which when deposited forms dunes or small sandy ridges.

Ephemeral – Present only during a portion of the year. Generally refers to water courses.

Erosion – The wearing away of the land surface by running water, wind, ice, or other geological agents.

Escarpment – A steep slope or cliff formed by erosion or, less often, by faulting.

Exclusion Area – An area identified through land-use plans or in the process of designating corridors for which rights-of-way are to be excluded.

Ethnography – The study and systematic recording of human cultures. Also the descriptive body of work produced from such research.

Extirpate – To destroy completely.

Extraction – The act of extracting or drawing a substance out of the earth (e.g., mining).

F

Fault – A fracture or fracture zone in the earth’s surface along where there has been displacement of the sides, relative to one another and parallel to the fracture.

Fauna – The wildlife or animals of a specified region or time.

Feature – A complex artifact or part of a site such as a thermal feature, soil stain, depression, rock alignment, or activity area.

Federal Energy Regulatory Commission (FERC) – The agency primarily responsible for ensuring adequate energy supplies at just and reasonable rates and providing regulatory incentives for increased productivity, efficiency, and competition.

Federal Land – All lands owned by the United States except land (1) in the National Park System, (2) held in trust for an Indian or Indian tribe, or (3) on the Outer Continental Shelf.

Federal Land Policy and Management Act of 1976 (FLPMA) – Public Law 94-579 of October 21, 1976. This law is often referred to as the BLM’s Organic Act, which provides the majority of the BLM’s legislated authority, direction, policy, and basic management guidance.

Federal Register – The official daily publication for rules, proposed rules, and notices of federal agencies and organizations, as well as executive orders and other presidential documents. The *Federal Register* is published by the Office of the Federal Register, National Archives and Records Administration.

Fire-cracked Rock – Rock which has been discolored, cracked or altered by exposure to fire.

Fishery – The complex of interactions within and between the population(s) of fish being harvested, the population(s) or anglers, and the environment of each.

Floodplain – The portion of a river or stream valley, adjacent to the river channel, which is built of sediments and inundated with water when the stream overflows its banks.

Forage – All browse and herbaceous foods available to grazing animals that may be grazed or harvested for feeding.

Foreground – The visible area from a viewpoint or use area out to a distance of 0.5 mile. The ability to perceive detail in a landscape is greatest in this zone.

Foreground-Middleground – The area visible from a travel route, residence, or other use area to a distance of 3 to 5 miles. The outer boundary of this zone is defined as the point where texture and form of individual plants are no longer apparent in the landscape. Vegetation is apparent only in patterns or outline.

Fossil – The remains or traces of an organism or assemblage of organisms preserved by natural processes in the earth’s crust; exclusive of organisms buried since the beginning of historical time.

Fuels Management – Fuels are vegetation (alive or dead) that can carry fire. Management of fuels includes attempting to modify fire behavior should a wildland fire occur.

Fugitive Emissions – Fugitive emissions are air pollutant emissions from facilities or activities that could not reasonably pass through a stack, chimney, vent, or other equivalent opening.

Fugitive Dust – Dust put into the atmosphere by the wind blowing over plowed fields, dirt roads, or desert or sandy areas with little or no vegetation. Also caused by mechanically generated particulate matter emissions put into the air by reason of vehicles or equipment moving soil or driving over unpaved roads (or dirty paved roads) and dusty areas.

G

Gauss – Measurement of the magnetic flux intensity (intensity of magnetic field attraction per unit area).

Generation source – Generating facilities convert various forms of energy into electric power.

Genus – One of the major taxonomic groups used to scientifically identify plants or animals. Several closely related species, or one species, make up one genus, while several genera or one genus make up a family.

Geologic Formations – A rock unit distinguished from adjacent deposits by some common character, such as its composition, origin, or the type of fossil associated with the unit.

Geology – The science that relates to the earth, the rocks of which it is composed, and the changes the earth has undergone or is undergoing.

Geothermal Resource – Heat found in rocks and fluids at various depths that can be extracted by drilling or pumping for use as an energy source. This heat may be residual heat, friction heat, or a result of radioactive decay.

Grant – Any authorization or instrument (e.g., easement, ease, license, or permit) the BLM issues under Title V of the FLPMA, 43 U.S.C. 1761 et seq. The term includes those authorizations and instruments the BLM and its predecessors issued for like purposes before October 21, 1976, under the existing statutory authority. It also includes any authorization or instrument the BLM issues pursuant to other right-of-way authorities such as the Act of March 3, 1891 (43 U.S.C. 946-951) as to other than public and National Forest land. It does not include authorizations issued under the Mineral Leasing Act (30 U.S.C. 185). Grassland Reserve Program – A program administered by the USDA Natural Resources Conservation Service and Farm Service Agency that provides financial assistance to landowners and operators to protect eligible grazing lands by voluntarily limiting future development and crop uses on the lands. (Food Security Act of 1985)

Grid – A transmission grid is a network of high-voltage, long-distance transmission lines and substations that connect generating facilities to distribution systems.

Ground Wire – Two wires installed along the transmission line at the top of the tower structures to protect the conductors from lightning strikes by transferring the energy from the lightning through the ground wires and structures into the ground below.

H

Habitat – The region where a plant or animal naturally grows or lives. A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and home range.

Habitat Fragmentation – A reduction in area of undisturbed, continuous habitat. Often affects interior forest species that depend on unbroken expanses of mature coniferous forest.

Habitation – A site inhabited or used intensively over an extended period of time, either year-round or on a seasonal basis. Habitations are frequently characterized by multiple activity areas, extensive and diverse scatters of lithic debitage and specialized tools, ceramics, architectural remains, storage structures, thermal features, and well-developed middens.

Habitat obligate – Species that is limited in its habitat to a few specific environmental conditions

Hazardous Air Pollutants – Air pollutants not covered by ambient air quality standards, but that may present a threat of adverse human health effects or adverse environmental effects, as defined in the Clean Air Act..

Herbaceous – Of, or having the nature of, an herb or herbs, as distinguished from woody plants.

Herd Management Area (HMA) – An area that has been designated for continuing management of wild horses.

Historic property – Any district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (maintained by the Secretary of the Interior [36 CFR 800]).

Human Environment – Includes the natural and physical environment and the relationship of people with that environment.

I

Impact – See “Effect”

Implementation Plan – A site-specific plan written to implement decisions made in a land-use plan. An implementation plan usually selects and applies best-management practices to meet land-use-plan objectives.

Indian Tribe – Any extant or historical tribe, band, nation, or other group or community of indigenous peoples in the United State that is federally recognized as eligible for special programs and services provided by the United States because of their status as Indians pursuant to the Indian Self-Determination and Education Assistance Act (25 U.D.C. 450 et seq.). An Indian tribe, situated within the boundaries of a state, exercises the powers of government and sovereignty, under the national government.

Indirect Effect – Caused by the action later in time or farther removed in distance, but still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth-rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8(b)).

Indirect Impact – Effects caused by the action and occur later in time or are farther removed, but are still reasonably foreseeable (see Direct Impact).

In-kind (as it relates to mitigation) – In-kind mitigation is the replacement or substitution of resources or values of the same type and kind as those affected (e.g., greater sage-grouse winter habitat is lost, and greater sage-grouse winter habitat is enhanced or conserved).

Instruction Memorandum – A memorandum containing policy or procedure.

Insulator – A device resistant to electrical conduction used for isolating and supporting conductors.

Interdisciplinary Team – A group of individuals with different training, representing the physical sciences, social sciences, and environmental design arts, assembled to solve a problem or perform a task. The members of the team proceed to a solution with frequent interaction so that each discipline can provide insights on any stage of the problem and disciplines can combine to provide new solutions. Also Agency Interdisciplinary Team.

Interior Board of Land Appeals (IBLA) – The IBLA is an appellate review body that exercises the delegated authority of the Secretary of the Interior to issue final decisions for the Department of the Interior. Its administrative judges decide appeals from bureau decisions relating to the use and disposition of public lands and their resources, mineral resources on the Outer Continental Shelf, and the conduct of surface coal mining operations under the Surface Mining Control and Reclamation Act. Located within the Department's Office of Hearings and Appeals, IBLA is separate and independent from the Bureaus and Offices whose decisions it reviews.

Intermittent – A river or stream that flows for a period of time, usually seasonally during rainy periods, and stops during dry periods. In arid regions, dry periods may be interrupted by occasional flash floods from brief but intense rain storms.

Invasive Species – A species that is not native (or is alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm to human health (Executive Order 13112).

Inventoried Roadless Area – An area identified by the U.S. Forest Service (USFS) as undeveloped, typically exceeding 5,000 acres, that meets minimum criteria for wilderness consideration under the Wilderness Act and has been inventoried during the USFS Roadless Area Review and Evaluation (RARE II) process, subsequent assessments, or forest planning. These areas can overlap with unroaded/undeveloped areas.

Issue – An issue is a point or matter of discussion, debate, or dispute about the potential environmental effects of an action. Issues point to environmental effects and may influence the development of alternatives to the proposed action.

J

Jurassic – The middle period of the Mesozoic era spanning the time between 201.3 and 145 million years ago, characterized by the dominance of dinosaurs and the appearance of flying reptiles and birds.

Jurisdictions – The limits or territory within which authority may be exercised.

K

Kcmil – Abbreviation for a thousand circular mils. Kcmil is a unit used to express large conductor sizes.

Kiln – A thermally insulated structure used for firing, burning, hardening, or drying materials.

Kilovolt (kV) – A kilovolt is equal to 1,000 volts. This unit of measurement is most commonly used when describing transmission and distribution lines.

Kilovolts per Meter (kV/m) – A unit measure of electric field strength.

L

Lacustrine – Lakes and ponds that have more than 2 acres in surface area.

Landform – A term used to describe the many types of land surfaces that exist as a result of geologic activity and weathering (e.g., plateaus, mountains, plains, and valleys).

Land and Resources Management Plan (LRMP) – An U.S. Forest Service land-use management plan that provides a framework for on-the-ground decision-making, for integrated resource management, and for guiding project and activity decision-making on a national forest, grassland, prairie, or other administrative unit.

Land Use Plan – As set of decisions that establish the direction for management of land within an administrative area, (pertaining to federal land, as prescribed under the planning provisions of the Federal Land Policy and Management Act).

Lek – A traditional courtship-display area attended by male greater sage-grouse in or adjacent to sagebrush-dominated habitat. Designation of the site as a lek requires the observation of two or more male sage-grouse engaged in courtship displays. New leks must be confirmed by a survey conducted during the appropriate time of day and during the strutting season. Observation of sign of strutting also can be used to confirm a suspected lek.

Land and Water Conservation Fund Site - The National Park Service provides matching grants to state and local governments for acquisition and development of public outdoor recreation areas and facilities. (Section 6(f)(3) of Land and Water Conservation Fund Act)

Linear Facility – Project or action with linear features such as roadways (i.e., interstates, state routes, minor roads, and off-highway vehicle routes), transmission and distribution line right-of-ways, federally designated utility corridors, existing highways (e.g., I-15, I-70, and I-80; U.S. Highways 6 and 40), pipelines, and railroads.

Link – A segment of a route alternative sharing common endpoints with adjacent links. Endpoints of a link are determined by the location of intersections with other segments (links) of other routes.

Lithics – A general term used to refer to chipped stone artifacts or debitage.

Lithic Procurement Area – An area from which raw materials were obtained and removed for lithic tool manufacture and refurbishing.

Lithology – The structure and composition of a rock formation, and the study of rocks with the unaided eye, or with little magnification.

Livestock Enclosure – Any roofed or unroofed structure designated to contain domestic animals. It may be constructed of any materials and incorporate natural features or vegetation as part of the enclosure.

Load (electric) – The amount of electric power delivered or required at any specific point or points on a system. The requirement originates at the energy-consuming equipment of the consumers.

LR2000 – A data base for land and mineral records of the BLM. It is used to retrieve individual data such as a case file serial page or to compile reports by case types or geographical location.

M

Megawatt (MW) – The generation of electricity is measured in megawatts (MW). 1 MW is equal to 1,000 kilowatts or 1 million watts.

Magnetic Field – Electric effect resulting from an electric current flowing in a conductor. Unit of measurement is a Gauss.

Mesozoic – An era of geologic time between the Paleozoic and the Cenozoic eras, spanning the time between 252.17 and 66 million years ago.

Metamorphic – A rock formed through metamorphism. Metamorphism is the change in the mineralogical, structural, or textural composition of rocks under intense heat and pressure (e.g., turning limestone into marble).

Migratory – Birds, animals, or people that migrate or move from one region or country to another.

Mineral Resources – Any inorganic or organic substance occurring naturally in the earth that has a consistent and distinctive set of physical properties. Examples of mineral resources include coal, nickel, gold, silver, and copper.

Minimization (as it relates to mitigation) – Minimizing impacts by limiting the degree or magnitude of the action and its implementation (40 CFR 1508.20).

Miocene – The epoch of the Tertiary period spanning the time between 23.03 and 5.3 million years ago.

Mitigate – To alleviate, reduce, or render less intense or severe.

Mitigation – Measures or procedures that could reduce or avoid adverse impacts and have not been incorporated into the proposed action or an alternative. Mitigation can be applied to reduce or avoid adverse effects on the human environment.

Monitoring – Actions performed to ensure compliance with the terms, conditions, and stipulations of a grant or temporary-use permit.

Mound (structural) – A pile of material and sediments that probably represent the remains of a habitation structure.

Mudstone – A hardened sedimentary rock consisting of clay that is similar to shale, but does not occur in distinct, bonded layers.

Multiple Use – Coordinated management of various surface and subsurface resources so that they are used in the combination that will best meet present and future needs.

N

National Ambient Air Quality Standards (NAAQS) – The Clean Air Act requires the EPA to set NAAQS (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. *Primary standards* set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. *Secondary standards* set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The EPA Office of Air Quality Planning and Standards has set National Ambient Air Quality Standards for six principal pollutants, which are called “criteria” pollutants.

National Conservation Area – An area designated by Congress, generally, to conserve, protect, enhance, and properly manage the resources and values for which it was designated for the benefit and the enjoyment of present and future generations (BLM Manual 6220).

National Environmental Policy Act of 1969 (NEPA) – Public Law 91-190. An Act that encourages productive and enjoyable harmony between man and his environment, promotes efforts to prevent or eliminate damage to the environment and biosphere, stimulates the health and welfare of man, enriches the understanding of the ecological systems and natural resources important to the nation, and establishes the CEQ.

National Historic Preservation Act of 1966 (NHPA) – Public Law 89-665; 16 U.S.C. 470 et seq. A law authorizing the Secretary of the Interior to expand and maintain a National Register of Historic Places and directing federal agencies to take into account the effects of their actions on historic properties and provide the ACHP a reasonable opportunity to comment.

National Monument – Area designated by the president of the United States by proclamation pursuant to the Antiquities Act of 1906 for the protection, restoration, or enhancement of the resources, objects, and values for which it was designated. (BLM Manual 6220)

National Register of Historic Places (NRHP) – A list of districts, sites, buildings, structures, and objects maintained by the National Park Service (NPS), each determined by NPS to be of historic, cultural, architectural, archaeological, or engineering significance at the local, state, or national level, established by the Historic Preservation Act of 1966.

Native American – A member of any of the aboriginal peoples of the western hemisphere, especially native peoples of the United States and its territories, including American Indians, Alaska Natives, Native Hawaiians, Chamorros, and American Samoans.

Native Load Customers – The wholesale and retail customers on whose behalf the transmission provider, by statute, franchise, regulatory requirement, or contracts, has undertaken an obligation to construct and operate the transmission provider’s system to meet the reliable electric needs of such customers.

Native Species – A species that, other than as a result of an introduction, historically occurred or currently occurs in an ecosystem (Executive Order 13112).

Native Vegetation – Natural vegetation originating in a certain region or country.

Nitrogen Dioxide (NO₂) – The result of nitric oxide (a gas formed by combustion and a precursor of ground-level ozone pollution, also known as smog) combining with oxygen in the atmosphere and a major component of photochemical smog. One of the six criteria pollutants.

Nitrogen Oxides (NO_x) – Product of combustion from transportation and stationary sources consisting of a mixture of nitrogen and oxygen compounds, including nitric oxide and nitrogen dioxide.

Node – The common endpoint of adjacent links.

Nonattainment Area – Area that does not meet one or more of the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act.

Nonspecular Conductors – Conductors treated to reduce reflection, rendering the conductor less shiny and noticeable.

Non-wilderness Study Area Lands With Wilderness Characteristics – Non-wilderness study area lands with wilderness characteristics are those lands that have been inventoried and determined by the BLM to contain wilderness characteristics as defined in Section 2(c) of the Wilderness Act of 1964, 16 U.S.C. 1131, et seq. These attributes include the area's size, its apparent naturalness, and outstanding opportunities for solitude or a primitive and unconfined type of recreation.

Notice of Availability (NOA) – The *Federal Register* notice that an EIS (draft or final) or record of decision is available. Publication of a notice of filing of an EIS by the Environmental Protection Agency formally begins the public comment period.

Notice of Intent (NOI) – This *Federal Register* notice announces that an EIS or an EA-level land-use plan will be prepared. Public of this notice formally starts the scoping process.

Notice to Proceed – A written authorization by the Authorized Officer that allows the holder to initiate actions under the grant. A notice to proceed usually is used to allow a grant to be issued, while preventing the holder from starting surface-disturbing activities before a plan of development (POD) is approved. The Authorized Officer can issue separate notices to proceed if the project involves distinct work phases and/or locations. Each notice to proceed will specify the nature of the work, location, and dates to be authorized.

Noxious Weed – A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or non-native, new, or not common to the United States.

O

Oligocene – The epoch of the Tertiary period spanning the time between 33.7 and 23.8 million years ago.

100-year Flood – A flood with a magnitude that may occur once every 100 years. A 1-in-100 chance of a certain area being inundated during any year.

Occupied Lek – A lek that has been active during at least one strutting season within the last 10 years. Management protection will be afforded to occupied leks.

Opportunity – Areas of opportunities for siting a transmission line; typically include linear features such as existing and future overhead lines, designated utility corridors, existing interstate and intrastate highways, pipelines, and railroads and areas where there are no environmental constraints precluding access to or siting of structures or facilities.

Out-of-kind (as it relates to mitigation) – Out-of-kind is the replacement or substitution of resources or values that are not the same type and kind as those affected but are related or similar (e.g., greater sage-grouse winter habitat is lost, but new greater sage-grouse nesting habitat is enhanced or conserved).

Outage – The period during which a generating unit, transmission line, or other facility is out of service.

Ozone (O₃) – A form of oxygen produced when an electric spark is passed through oxygen or air. One of six criteria pollutants.

P

Paleocene – The first geologic epoch of the Cenozoic Era covering the time between 66 and 56 million years ago. This is the era immediately following the extinction of the dinosaurs.

Paleontology – The science that deals with the life of past geological ages through the study of the fossil remains of organisms.

Paleontological Resources – Any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth.

Paleozoic – The geologic era between the Precambrian and Mesozoic eras covering the time between 541 million and 252.17 million years ago. The era was characterized by the development of the first fish, amphibians, reptiles, and land plants.

Palustrine – A marsh or marsh-like environment.

Particulate Matter – Minute, separate particles, such as dust or other air pollutants. PM₁₀ is a measure of particles in the atmosphere with a diameter of less than, or equal to, a nominal 10 micrometers aerodynamic equivalent diameter. PM_{2.5} is a measure of particles in the atmosphere with a diameter of less than, or equal to, a nominal 2.5 micrometers aerodynamic equivalent diameter. These are criteria pollutants.

Peak Demand – The maximum load during a specified period of time.

Peaking Capacity – Capacity of generation equipment normally reserved for operation during the hours of highest daily, weekly, or seasonal loads. Some generating equipment may be operated at certain times as peaking capacity and at other times to serve loads on an around-the-clock basis.

Per Capita Income – Calculated by dividing total income in a specified area (e.g., county) by the area's population.

Perennial – Lasting or active through the whole year. May refer to rivers, streams, or plants.

Petroglyph – A design or motif pecked, incised, abraded, scratched, or carved with a sharp element into a rock surface.

Physiographic Province – An area characterized by distinctive topography, geologic structure, climate, drainage patterns, and other features and phenomena of nature.

Pictograph – A design or motif produced by painting with mineral pigments on a rock surface; painted rock art.

Pithouse – A habitation structure built entirely or partially underground.

Plan of Development (POD) – A complete description of and design for the proposed project. It includes, but is not limited to, proposed plans, specifications, construction methods, schedules, restoration practices, and other information pertinent to the proposal; the POD becomes part of the right-of-way grant or permit. The POD can include sections for construction, maintenance, and termination. The content of the POD will vary with the complexity of the proposal.

Plateau – An elevated tract of relatively level land, such as a tableland or mesa.

Playa – The shallow central basin of a desert plain where water gathers after a rain and is evaporated.

Pleistocene – The first geologic epoch during the Quaternary period, spanning from 2.6 million years ago to about 9000 Before Present, characterized by extensive continental glaciations in the Northern Hemisphere.

Policy – A guiding principle on which a specific decision or set of decisions is based.

Population – A group of organisms, all of the same species, which occupies a particular area. The term is used to refer to the number of individuals of a species within an ecosystem or of any group of like individuals.

Potential Fossil Yield Classification (PFYC) – A system of classification by which geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts, with a higher class number indicating a higher potential. This classification is applied to the geologic formation, member, or other distinguishable unit, preferably at the most detailed mappable level. The PFYC system is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. The classes that serve as guidelines for identifying potential for a formation to yield fossils include Class 1 – Very Low, Class 2 – Low, Class 3 – Moderate or Unknown, Class 4 High, and Class 5 – Very High.

Power – A term usually meant to imply both energy and capacity.

Precambrian – The earliest geologic era covering all time from the formation of the earth and ending at the Paleozoic Era, which began about 541 million years ago.

Preferred Alternative – The alternative believed to reasonably accomplish the purpose and need for the proposed action while fulfilling the statutory missions and responsibilities, giving consideration to economic, environmental, technical, and other factors. This alternative may or may not be the same as the applicant’s preferred alternative.

Primitive – An area that is not developed; a pristine natural area.

Project Area – The preliminary study area defined to examine all feasible siting corridors for the Project. Established by the Applicant’s interest and objectives for the Project, the Project description and other siting criteria such as potential major substation interconnect points, existing designated utility corridors, existing extra-high-voltage transmission lines, geography, and land-use designations (e.g., National Parks, wilderness areas).

Proposal – The stage in the development of an action when a federal agency has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal, and the effects can be meaningfully evaluated (40 FR 1508.23). Then a federal agency receives or makes a proposal, the NEPA process begins.

Proposed Action – A proposal for a federal agency to authorize, recommend, or implement an action to address a clear purpose and need. Alternatives are developed to consider different reasonable paths to take to accomplish the same purpose and need of the proposed action.

Protest – An opportunity for a qualified party to seek an administrative review of a proposed decision in accordance with program-specific regulations. For example, a protest may be filed with the Director of the BLM for review of a proposed resource management plan or plan amendment (43 CFR 1610.5-2), or a proposed grazing decision may be protested for review by the Authorized officer (43 CFR 4160.2).

Public Land (FLPMA) – Any land and interest in land owned by the United States within the several states and administered by the Secretary of the Interior through the BLM without regards to how the United States acquired ownership except (1) land located on the Outer Continental Shelf and (2) land held for the benefit of Indians, Aleuts, and Eskimos.

Public Land (other) – As used in this document, federally owned surface or mineral estate specifically administered by the BLM.

Q

Quarry – An area from which rock or minerals (e.g., ore, limestone, coal, gravel, and sand pits) have been excavated and extracted for use off-site.

Quaternary – The second period of the Cenozoic era spanning 1.8 (recently refined to 2.6) million years ago to the present. This is the period of glaciations in the northern hemisphere.

Quaternary Fault – A fault that has been active or has had displacement during the Quaternary Period, between 1.8 million years ago and the present. These faults are most likely to be active on human time scales.

R

Raptor – A bird of prey.

Reclamation – Returning disturbed lands to a form and productivity that will be ecologically balanced.

Reconnaissance – Preliminary examination or survey of a territory.

Recontouring – Returning a surface to, or near to, its original form through some type of action, such as grading.

Record of Decision (ROD) – A document separate from, but associated with, an EIS that publicly and officially discloses the responsible official's decision on the proposed action.

Recreation Opportunity Spectrum (ROS) – A planning process that provides a framework for defining classes of outdoor recreation environments, activities, and experience opportunities. The settings, activities, and opportunities for experiences are arranged along a continuum or spectrum of classes. The resulting analysis defines specific geographic areas on the ground, each of which encompasses one of the classes.

Rectify (as it relates to mitigation) – Rectifying the impact by repairing, rehabilitating, or restoring the affected environment (40 CFR 1508.20).

Reduce or Eliminate Over Time (as it relates to mitigation) – Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action (40 CFR 1508.20).

Reference Centerline – For purposes of assessing impacts and recommending mitigation, a centerline is assigned that may be slightly adjusted during engineering design.

Region – A large tract of land generally recognized as having similar character types and physiographic types.

Renewable Resource – Any natural resource that can replenish itself naturally over time.

Research Natural Area – A part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity of National Forest System lands. Research Natural Areas are principally for nonmanipulative research, observation, and study. (Forest Service Manual-4063)

Residual Impact – Those impacts remaining after mitigation has been applied to the proposed action or an alternative.

Reasonably Foreseeable Action – Actions for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends.

Reasoned Choice – A choice based on a “hard look” at how the proposed action or alternatives respond to the purpose and need.

Residual impact – Impacts from a land-use authorization that remain after applying avoidance, minimization, rectification, and reduction/elimination measures; also referred to as unavoidable impacts.

Resource Management Plan – A set of decisions that establish the direction for management of land within an administrative area, in this case, land administered by the BLM, as prescribed under the planning provisions of the Federal Land Policy and Management Act of 1976, as amended, P.L. 94-579, 90 Stat. 2743.

Revegetation – The reestablishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance, such as reseeding.

Rhizomatous – Having a long underground stem system that cannot be viewed above ground and which may disintegrate over time

Right-of-way – A permit or grant that authorizes the use of lands for certain specified purposes, commonly for pipelines, roads, telephone lines, electric transmission lines, reservoirs, etc.; also, the land covered by such a permit or grant.

Riparian – A transition between wetlands or water bodies and upland areas. An aquatic or terrestrial ecosystem associated with bodies of water, such as streams, lakes, or wetlands, or is dependent on the existence of perennial, intermittent, or ephemeral surface or subsurface water drainage. Riparian areas are usually characterized by dense vegetation and an abundance and diversity of wildlife.

Rock Art – Inclusive term referring to both pictographs and petroglyphs

Route – A transmission route is the general path of a transmission line and associated facilities.

S

Sandstone – A common sedimentary rock primarily composed of sand grains, mainly quartz cemented together by other minerals.

Scenic Backway – A paved or dirt road reaching secluded areas of natural beauty.

Scenic Byway – A specially designated road that travels through an area of natural beauty.

Scenic Quality – The visual appeal of a tract of land based on landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications in relationship to the natural landscape.

Scenic Quality Rating Unit (SQRU) – A portion of the landscape that displays primarily homogeneous visual characteristics of the basic landscape features (landform, water, vegetation, and structures and modifications), which separate it from the surrounding landscape.

Sediment – Solid fragmental material, either mineral or organic, transported or deposited by air, water, gravity, or ice.

Segment – A combination of links.

Selective Mitigation – Measures or techniques developed to reduce adverse impacts on a case-by-case or selective basis.

Semi-arid – A climate or region characterized by little yearly rainfall and the growth of a number of short grasses and shrubs.

Sensitivity – The state of being readily affected by the actions of external influence.

Sensitivity Level Rating Unit (SLRU) – The designation (high, medium, or low) assigned to a landscape area to indicate the concern of the public to changes in the landscape (BLM designation).

Series Compensation Station – Facility that improve the transport capacity and efficiency of the transmission line.

Shield Wire – (see Ground Wire)

Significant Impact – Effects of sufficient context and intensity that an EIS is required. The Council on Environmental Quality regulations at 40 CFR 1508.27(b) include ten considerations for evaluating intensity.

Simulations – The use of a computer to calculate the effect of a given physical process.

Site – In general, a compact area, usually involving nonlinear facilities (e.g., substation, series compensation station). In archaeology, any locale showing evidence of human activity.

Special Recreation Management Area (SRMA) – An administrative unit where the existing or proposed recreation opportunities and recreation setting characteristics are recognized for their unique value, importance, and/or distinctiveness, especially as compared to other areas used for recreation.

Special Recreation Use Permit – An authorization which allow for recreation uses of the public lands and related waters. They are issues as a means to control visitor use, protect recreational and natural resources, and provide for the health and safety of visitors. (BLM Handbook H-2930-1)

Species – A group of individuals of common ancestry that closely resemble each other structurally and physiologically and in nature interbreed, producing fertile offspring.

Spanning – Placing tower structures so the transmission line extends across a sensitive area or resource

Spring – A place where groundwater flows naturally onto the land surface, often the source of a stream.

Staging Area – A designated area where vehicles, supplies, and construction equipment are positioned for use and access to a construction site.

Stipulation – A condition, requirement, or term specified in a grant.

Structures – Structures support transmission lines. Structures are different sizes and shapes depending on the voltage of the line and number of circuits each tower structure need to carry.

Study Area – A given geographical area delineated for specific research.

Study Corridor – The area of study (i.e., resource inventory and effects analysis) for a particular resource determined by the Agency Interdisciplinary Team; varies for each resource based on the area that potentially could be affected.

Subspecies – Any natural subdivision of a species that exhibits small, but persistent morphological variations from other subdivisions of the same species living in different geographical regions or times.

Substantial Deviation – Change in the authorized locations or use that requires (1) construction or use outside the boundaries or the right-of-way or temporary-use permit or (2) any change from, or modification of, the authorized use.

Substantive Comment – A comment that does one or more of the following: (1) questions, with reasonable basis, the accuracy of information in the EIS or EA; (2) questions, with reasonable basis or facts, the adequacy of, methodology for, or assumptions used for the environmental analysis; (3) presents reasonable alternatives other than those presented in the EIS or EA; or (4) promotes the lead agency to consider changes or revisions in one or more of the alternatives.

Substation – An electrical power station that is the connection point between transmission and distribution systems. Substations house the equipment used to route, control, and protect the flow of power in the electrical system. It also is a facility in an electrical transmission system with the capability to transform power to a higher or lower voltage. Equipment includes transformers, circuit breakers, and other equipment for switching, changing, or regulating the voltage of electricity.

Substrates – Sediment that lies beneath the surface of the earth.

Sulfur Dioxide (SO₂) – A pungent, colorless, gas formed primarily by the combustion of fossil fuels. One of the six criteria pollutants.

Sweathouse – An enclosure or hut used for steam baths, usually ephemeral in construction.

Synergistic – Interaction of conditions such that the total effect is greater than the sum of the individual effects.

T

Take – As defined by the Endangered Species Act, “to harass, harm, pursue, hunt, shoot, wound, kill, capture, or collect, or attempt to engage in any such conduct.”

Talus – A pile of rock debris at the foot of a cliff or steep slope.

Tangent Structure – Typical transmission line structure. Can be one of several types placed four to five per mile in linear position.

Taxonomy – A system of arranging animals and plants into natural, related groups based on some factor common to each, such as structure or biochemistry.

Technical Report – Documentation of detailed studies summarized in the Draft EIS.

Temporary-use Permit (TUP) – A document the BLM issues under 30 U.S.C. 185 that is a revocable, nonpossessory privilege to use specified federal land in the vicinity of, and in connection with a right-of-way to construct, operate, maintain, or terminate a pipeline to protect the environment or public safety. A TUP does not convey any interest in land.

Tepee – A temporary, tripod or conical habitation structure constructed of elk or buffalo hide, cut limbs, grass, brush, or bark overlaying a frame.

Tertiary – The first period of the Cenozoic era (after the Mesozoic era and before the Quaternary period), spanning the time period between 66 and 2.6 million years ago.

Thermal Feature – A localized area of controlled intentional burning. Includes fire pits, fire rings, burned rock rings, and slab-lined hearths.

Third-party Contracting – Contracting for the preparation of NEPA documents that is funded by the non-federal proponent of an action. The federal agency must provide the direction for preparing the NEPA document and must approve the analysis and document.

Threatened Species ('I' or LT) – Any plant or animal species defined under the Endangered Species Act as likely to become endangered within the foreseeable future throughout a significant portion or all of its range; listings are published in the *Federal Register*.

Traditional Cultural Property (TCP) – Any built or natural locations, areas, or features considered sacred or culturally significant by a group or people because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community.

Transmission – The movement or transfer of electric energy over an interconnected group of line and associated equipment between points of supply and points at which it is transformed for delivery to consumers, or is delivered to other electric systems. Transmission is considered to end with the energy is transformed for distribution to the consumer.

Transmission Line – Transmission lines connect the power produced at generating facilities to substations. Over long distances, it is most effective to transport electricity at high voltages.

Transmission System – An interconnected group of electric transmission lines and associated equipment for moving or transferring electric energy in bulk between point of supply and points at which it is transformed for delivery over the distribution system lines to consumers, or is delivered to other electric systems.

Trash Scatter – A non-purposeful surficial arrangement of discarded historic artifacts.

Triassic – The first period of the Mesozoic era spanning the time between 252.17 and 201.3 million years ago, characterized by the first appearance of dinosaurs and mammals.

Tributary – A stream or river that flows into a larger stream or river.

U

Unauthorized Use – The use, occupancy, or development of the public land without authorization or using, occupying, and developing them in a way that is beyond the scope and terms and conditions of an authorization. It includes acts or omissions causing undue or unnecessary degradation to the occupied public land.

Unemployment – Persons are classified as unemployed if they do not have a job, have actively looked for work in the prior 4 weeks, and are currently available for work. Persons who were not working and were waiting to be recalled to a job from which they had been temporarily laid off are also included as unemployed. The unemployment rate represents the number unemployed as a percent of the labor force.

Ungulate – A hoofed typically herbivorous quadruped mammal.

Unroaded/Undeveloped Area – An area identified by the USFS containing wilderness qualities or attributes and roadless qualities pursuant to the National Forest System Land Resource Management Planning Rule of 1982. These areas can overlap with inventoried roadless areas.

Uranium – A very hard, heavy, silvery, metallic, chemical element that is crucial to the research and development of atomic energy.

V

Vegetation Communities – A combination of dominant plant species that live together in the same region or on the same landform.

Vegetation Clearing – Clearing of vegetation in the Project right-of-way prior to Project construction.

Viewshed – Visible portion of the specific landscape seen from a specific viewpoint, normally limited by landform, vegetation, distance, and existing cultural modifications.

Visual Management Objectives – The term used in this study to generally define Visual Resource Management (BLM) or Visual Quality Objectives (USFS).

Visual Resource – Visible feature of the landscape, such as land, water, vegetation, and other features that make up the scenery of an area.

Visual Resource Inventory (VRI) Classes – Classification of landscape areas composed of scenic quality, sensitivity level rating units (SLRU), and distance zones for inventory purposes (BLM).

Visual Resource Management (VRM) Classes – Classification of landscapes according to the kinds of structures and changes acceptable to meet established visual goals (BLM).

Visual Management System (VMS) – System to inventory existing scenic values and to manage USFS-administered lands based upon meeting visual management goals (USFS).

Visual Quality Objectives (VQO) – Classification of landscapes to set an acceptable level of alteration from the natural landscape (USFS).

Volatile Organic Compound (VOC) – Any organic compound that participates in atmospheric photochemical reactions except those designated by the EPA as having negligible photochemical reactivity.

Volt – A measure of electrical potential difference that would cause a current of ampere to flow through a conductor whose resistance is 1 ohm.

Volts Per Meter – A unit of measurement of an electric field.

W

Waters of the United States – All waters currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including adjacent wetlands and tributaries to waters of the United States, and all waters by which the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce.

Watershed – All lands that are enclosed by a continuous hydrologic drainage divide and lay upslope from a specified point on a stream.

Watt – A unit of electrical power equal to 1/756 horsepower.

Wetlands – Those areas inundated by surface or groundwater with a frequency sufficient to support vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

Wickiup – A temporary, dome-shaped habitation structure constructed of cut limbs, matting, reeds, reed matting, or bark overlaying a frame.

Wild and Scenic River (WSR) – A system of nationally designated rivers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values and are preserved in a free-flowing condition. Types of streams include flowing bodies of water or estuaries or a section, portion, or tributary thereof, including rivers, streams, creeks, runs, kills, rills, and small lakes, the system consists of three types of streams: (1) recreation—rivers or sections of rivers that are readily accessible by road or railroad and hat may have some development along their shorelines and may have undergone some impoundments or diversion in the past; (2) scenic—rivers or sections of rivers free from impoundments with shorelines or watersheds still largely undeveloped but accessible in places by roads; and (3) wild—rivers or sections of rivers free of impoundments and generally inaccessible except by trails, with watersheds or shorelines essentially primitive and waters unpolluted.

Wild Horse Herd Management Area – A herd area that has been evaluated and determined by the BLM to have adequate food, water, cover, and space to sustain healthy and diverse wild horse and burro populations over the long-term (BLM Handbook H-4700-1).

Wilderness – A congressionally designated area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation that is protected and managed to preserve its natural conditions, as described in Section 2A of the Wilderness Act of 1964.

Wilderness Characteristics – Characteristics of lands that include a lack of permanent human improvements or habitation, primeval character intact, affected primarily by the forces of nature, and/or presence of outstanding opportunities for solitude or a primitive and unconfined type of recreation.

Wilderness Study Area – A roadless area or island of undeveloped federal land inventoried and found to possess wilderness qualities or attributes described under Title VI, Section 603 of the Federal Land Policy and Management Act and Section 2C of the Wilderness Act of 1964. These characteristics include the following:

- (1) generally appears to have been affected mainly by the forces of nature, with human imprints substantially unnoticeable
- (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation
- (3) has at least 5,000 acres or is large enough to make practicable its preservation and use in an unimpaired condition
- (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value

Wilderness Qualities or Attributes – Key qualities or attributes of wilderness listed in section 2(c) of the Wilderness Act of 1964 and used by BLM in conducting wilderness inventories. These characteristics

are features of the land associated with the concept of wilderness that specifically deals with naturalness and opportunities for solitude and primitive and unconfined recreation. These characteristics may be considered in land use planning when BLM determines those characteristics are reasonably present, of sufficient value (condition, uniqueness, relevance, importance), need (trend, risk), and practical to manage (from IM-2003-275, Change 1, Considerations of Wilderness Characteristics in Land Use Plan, Attachment 1).

Wildlife Habitat Management Area (WHMA) – Special management areas that are designed to protect or preserve certain qualities or uses for wildlife and plant species. The environment in these areas is unique in some respects, and it is therefore desirable to apply to different management prescriptions to these areas from those of the surrounding public lands. The integration of different land-management goals, objectives, and actions will be implemented to ensure that the integrity of these areas will be maintained. They will be directed toward habitat management rather than species management and encompass featured species and species diversity to ensure compliance with existing laws; prevent species from becoming threatened or endangered, and provide values and uses for the public.

Wind Energy – Form of energy conversion in which turbines convert the kinetic energy of wind into mechanical or electrical energy that can be used for power.

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APPENDIX A – APPLICANT’S INTERESTS AND OBJECTIVES

Project Background

The Applicant for the Energy Gateway South Transmission Project (Project), PacifiCorp, serves more than 1.7 million retail electric customers (native load) in the states of California, Idaho, Oregon, Utah, Washington, and Wyoming (Figure 1). The Project would be built in the service area of Rocky Mountain Power (the Company), a business unit of PacifiCorp, which delivers electricity to more than a million retail customers in its service area, which includes Utah, Wyoming, and Idaho.

Within the Company’s service area, there has been more than a decade of population growth and economic prosperity. Coupled with an increase in per-customer electric usage, this growth has resulted in a significant increase in the overall demand for electricity. As a result, the transmission system used to provide the Company’s customers with access to low-cost generating resources and provide reliable service is now fully utilized. Consequently, significant new transmission infrastructure is needed to adequately serve the Company’s existing and forecasted customer needs.

Since 1996, the population in the counties served by the Company has grown substantially. While near-term economic conditions have slowed, the Company’s service territory continues to grow in all customer segments, and currently forecasts an increase overall energy usage across its system at an average of 2.3 percent per year over the next 5 years and by 2 percent each year over the next 10 years (Section 2.3). The Company currently has approximately 12,500 megawatts (MW) of existing resources, and its 10-year planning forecast predicts it will need approximately 15,000 MW by 2020 (Section 2.3).

The Company’s need for the Project is tied to its obligations as a regulated utility to increase its transmission capacity and to provide safe, reliable electricity to its customers at a reasonable cost. The purpose of this Project is to alleviate constraints within the Company’s existing transmission system, provide integration of additional planned and existing transmission segments and improve system reliability and operational flexibility of the bulk electric system. The addition of this line also would provide opportunity to maintain the system with fewer operational constraints.

Numerous studies have been used to inform the design of the Company’s recommended bulk electric transmission additions, which resembles a triangular footprint over Idaho, Utah, and Wyoming, with paths extending into Oregon and Washington. The footprint defined by these studies is now known as Energy Gateway. PacifiCorp’s priority in building Energy Gateway is to meet the needs of its customers.

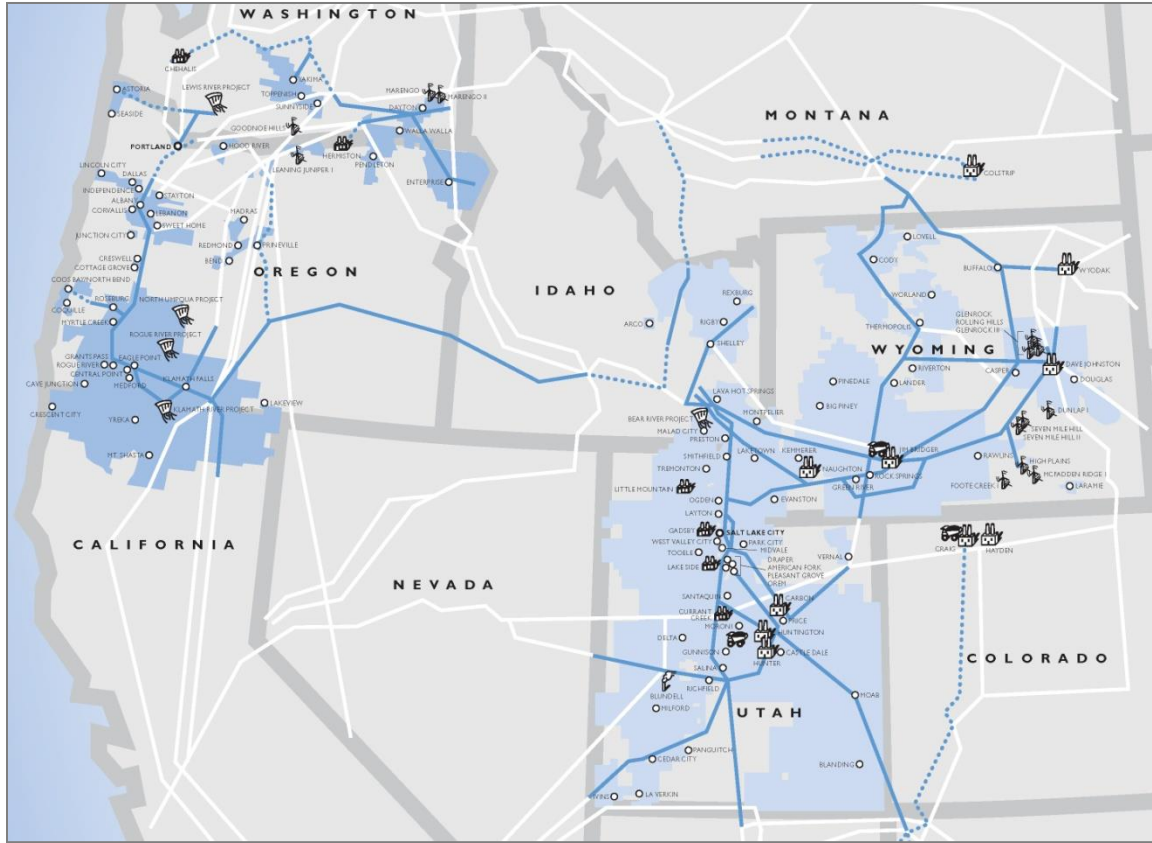


Figure 1 PacifiCorp Service Territory

1.0 Acronyms and Definitions

Several acronyms and technical concepts are used in the document and the reader will better understand this report by becoming familiar with the following terms:

- **Adjacent Transmission Circuits:** (as defined by Western Electricity Coordinating Council [WECC] TPL-001-WECC-CRT-2 System Performance Criterion) Two transmission circuits with separation between their center lines less than 250 feet at the point of separation with no Bulk Electric System circuit between them. Transmission circuits that cross, but are otherwise separated by 250 feet or more between their centerlines, are not Adjacent Transmission Circuits.
- **Bulk Electric System:** The electrical generation resources, transmission lines, interconnections with neighboring systems and associated equipment generally operated at voltages of 100 kilovolts (kV) or higher. Radial transmission facilities serving only load with one transmission line source generally are not in this definition.
- **Contingency Analysis:** The assessment of risk that certain scenarios resulting from outage events may pose to an electrical network.
- **Electrical Transfer:** Power in an alternating current (AC) electric network does not travel along any one set path. Instead, power flows from a “generation source” to a “load sink” along all the paths that can connect them. This means that changes in generation and transmission at any point in the system will change loads on generators and transmission lines at every other point—often in ways not easily controlled.

- **Electrical Transmission Capacity:** The amount of power, measured in megawatts (MW), flowing over each transmission line. This amount must remain at or below the line’s rated capacity to prevent thermal overloading or power-supply instability such as phase and voltage fluctuations. Capacity limits vary, depending on the length of the line, type/size of the line conductor and the transmission voltage.
- **Energy Gateway Program:** The Company’s large-scale transmission expansion program that consists of three principal legs: Energy Gateway Central, Energy Gateway West, and the subject project, Energy Gateway South Transmission Project. The Company also considers the Sigurd to Red Butte 345kV No. 2 Project to be within the scope of the Energy Gateway Program.
- **Extra-high Voltage (EHV):** Electric transmission facility energized at 300,000 volts (300kV) or greater.
- **Fault:** A condition when one or more electrical conductors contact the ground and/or each other typically resulting in protective equipment tripping out of service to stop the fault current that is several times larger in magnitude than the current that normally flows through a circuit.
- **Generation Tripping:** An intentionally engineered loss or shut-down of generation facilities in response to system disturbances.
- **Load Shedding:** An electrical power outage wherein customer’s electrical service is interrupted. Causes can be due to insufficient electrical generation capacity or transmission system outages. Load shedding, under certain contingency conditions, may be used by an electric utility company in order to avoid a cascading event that may result in a widespread blackout of the power system.
- **Mean Time Between Failures (MTBF):** The elapsed time between failures of a system element or event during operation.
- **North American Electric Reliability Corporation (NERC):** NERC is a self-regulatory, non-government organization that has statutory responsibility to regulate bulk power system users, owners, and operators through the adoption and enforcement of standards for fair, ethical and efficient practices. As of June 18, 2007, the Federal Energy Regulatory Commission (FERC) granted NERC the legal authority to enforce reliability standards with all users, owners, and operators of the bulk power system in the United States, and made compliance with those standards mandatory and enforceable.
- **Redundancy:** The duplication of critical system components or transfer capacity of a system with the intention of increasing or maintaining reliability, usually in the case of a backup or fail-safe.
- **Contingency Reserves:** The generating capacity immediately available to a system operator to meet customer demand in the event of a generator(s) failure or transmission system outages. (i.e., contingencies).
- **Western Electricity Coordinating Council:** WECC is the regional entity responsible for coordinating and promoting bulk electric system reliability in the Western Interconnection (one of the two major AC power grids in North America, the other being the Eastern Interconnection). In addition, WECC assures open and non-discriminatory transmission access among members, provides a forum for resolving transmission access disputes and provides an environment for coordinating the operating and planning activities of its members as set forth in the WECC Bylaws.

2.0 Applicant’s Need

2.1 Summary

PacifiCorp needs to make improvements to its bulk transmission network in order to transport electricity reliably from generation resources (owned generation and market purchases) to various load centers. Additional transmission infrastructure is needed to:

- Maintain compliance with mandated national reliability standards that require the Company to have a plan to: “operate to supply projected customer demands and projected Firm Transmission Services, at all demand levels over the range of forecast system demands...”¹
- Meet obligations and requirements specifically required under the Company’s Open Access Transmission Tariff (OATT) approved by the Federal Energy Regulatory Commission (FERC).
- Insure customers have an adequate supply of reliable and low-cost energy
- Reliably deliver power to continuously changing customer energy-supply demands under a wide variety of system-operating conditions.
- Supply all electrical demand and energy requirements of customers at all times, taking into account scheduled and unscheduled system outages.
- Allow the Company to access energy available from existing markets and to sell excess generation to those existing markets when it is economic to do so for customers.
- Support options for generation resource development including economically feasible renewable generation as specified in the Company’s current and future Integrated Resource Plans.
- Meet the current and reasonably anticipated energy supply requirements, policies, rules and laws at the federal level and in the states the company serves.

In particular, the Project is needed to fulfill the following key responsibilities of the Company:

Serve Native Load. The Company is responsible for providing electric service to 1.7 million retail customers in the states of California, Idaho, Oregon, Utah, Washington, and Wyoming. The Company has a legal obligation to ensure sufficient firm point-to-point and network transmission capacity is available to meet the electric demands of all its customers now and into the future.

Serve Third-Party Network Customers. In addition to providing service to its native load customers, the Company also is required to provide transmission service to its third-party network customers, which in turn directly serve customers in these same states. The Company has a legal responsibility to provide reliable transmission service to third parties to the degree transmission capacity is available.

Ensure Reliability. The Project is needed to improve the Company’s ability to provide reliable electrical service to all its customers in a nondiscriminatory manner. The Project also is needed to provide redundancy during transmission and generation contingencies for other planned and existing transmission segments (Gateway West and Gateway Central, respectively), thereby providing operational flexibility for the bulk electric system, ensuring reliability, and supporting capacity ratings for each segment.

Access to Energy Resources. The Company has a legal obligation to transport identified third-party network generation to serve network loads. The Project is needed to provide the Company with access to rich and diverse generation resources throughout its service territory needed to meet the growing

¹NERC Transmission Planning Standard TPL-002-1.

electrical demands of its customers. In general, expansion of the transmission system is needed to accommodate a variety of future resource scenarios and plans.

Maximize Infrastructure Benefits. When interconnected to the wider electric system in the west, the Project would function as a fully interconnected electric system element in the west-wide electric grid and would be expected to carry its fully rated capacity (1,500 MW of electrical power flow) across the system. When interconnected with other Energy Gateway segments (Gateway West and Gateway Central), the Project would allow all Energy Gateway segments to achieve their fully rated capacities.

2.2 Applicant’s Needs as a Regulated Utility

The Company is a vertically integrated electric utility under the jurisdiction of the FERC and six state regulatory commissions. The Company sells electricity primarily in the retail market, with sales to residential, commercial, industrial, and other customers. It also sells electricity in the wholesale market when excess electricity generation exists or when required for other system-balancing activities. The Company’s business unit of the PacifiCorp operates under oversight and regulatory controls of the Public Service Commission of Utah, Wyoming Public Service Commission, and the Idaho Public Utilities Commission. PacifiCorp also provides service to more than 730,000 retail customers in the states of Oregon, Washington, and California under the trade name Pacific Power. Pacific Power is subject to the regulatory oversight of the Oregon Public Utility Commission, Washington Utilities and Transportation Commission, and California Public Utilities Commission.

As provided in the Company’s OATT under Sections 15.4, 28.2, and 28.3, the Company is obligated to expand its transmission system to provide requested firm point-to-point and network transmission service, and to construct and place in service sufficient capacity to deliver resources reliably to network and native load customers. The Company’s Attachment K of the OATT also requires planning for the expansion of the system to ensure that its transmission system meets industry, regulatory, and reliability standards. The Company is subject to both mandated and voluntary standards directed at increasing supply of renewable (“green”) energy sources as part of its overall least-cost risk-adjusted energy-resource portfolio. The Energy Gateway program and the Project are both needed to ensure these long-term requirements are met. The Company, under the NERC and WECC reliability standards, needs to plan, construct and operate its system in a manner that accounts for the overall reliability of the nation’s electric supply system.

Additionally, the Company requires new transmission capacity to adequately serve its customers’ load and growth needs across the next 20-year horizon and beyond. Recognizing the potential regional benefits of trying to “upsized” the Project (such as maximizing the use of energy corridors, minimizing environmental impacts, and improved economies of scale), the Company included in its original Energy Gateway plan the potential for doubling the Project’s capacity to encourage third-party commitments and equity partnerships necessary to support such an investment. In the years since the May 2007 announcement of Energy Gateway, the Company has pursued such partnerships but due to the significant costs inherent in transmission investments—and the Company’s obligation to shelter its customers from costs and risks associated with “upsizing” the Project exclusively for the third-parties’ benefit—these commitments have not materialized. The Company is committed to building Energy Gateway to meet the needs of its customers and is moving ahead with the appropriate investments to do so, which for the Project is reflected by its description as a single-circuit 500kV facility.

In summary, the Company’s obligations as a regulated utility require it to:

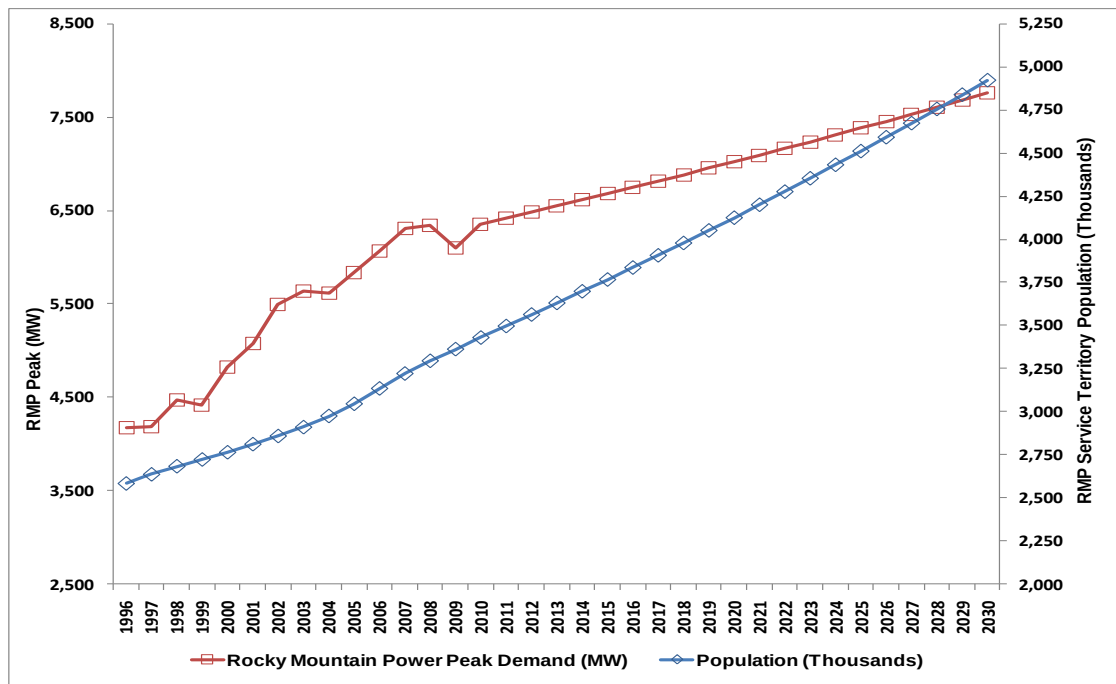
- Provide increased capacity as required to serve existing and growing loads.
- Meet contract obligations provided for under transmission service agreements.

- Identify reliability and system constraints within the Company’s existing transmission system that necessitate the improvement and/or development of new transmission paths.
- Provide safe, reliable electricity to its customers at a reasonable cost.
- Ensure sufficient infrastructure is available to generate, transmit, and distribute electricity to its 1.7 million retail customers.

2.3 Need to Increase Capacity

Current and Projected Electrical Demand

Since 1996 the population in the counties served by the Company has grown substantially². Along with this growth there has been an even greater growth in the demand for electricity³ (Figure 2). As a regulated utility serving these counties, the Company needs to provide safe, reliable service to existing and future customers on a nondiscriminatory basis.



Data derived from IHS Global Insight. Not to be reproduced without permission.

Figure 2 – Growth of Rocky Mountain Power’s Peak Demand and Population in its Service Territory

While near-term economic conditions have slowed, the Company’s service territory continues to see growth within all customer segments. One of the more significant drivers of this growth is demand from the extractive industries in the states served by the Company. The Company currently forecasts an increase in overall energy usage across its system at an average of 2.3 percent each year over the next 5 years and by 2 percent each year over the next 10 years⁴ (Figure 3).

²SOURCE: IHS Global Insight state and county estimates, December 2010.

³SOURCE: Rocky Mountain Power billing system.

⁴SOURCE: Rocky Mountain Power 2011 Business Plan.

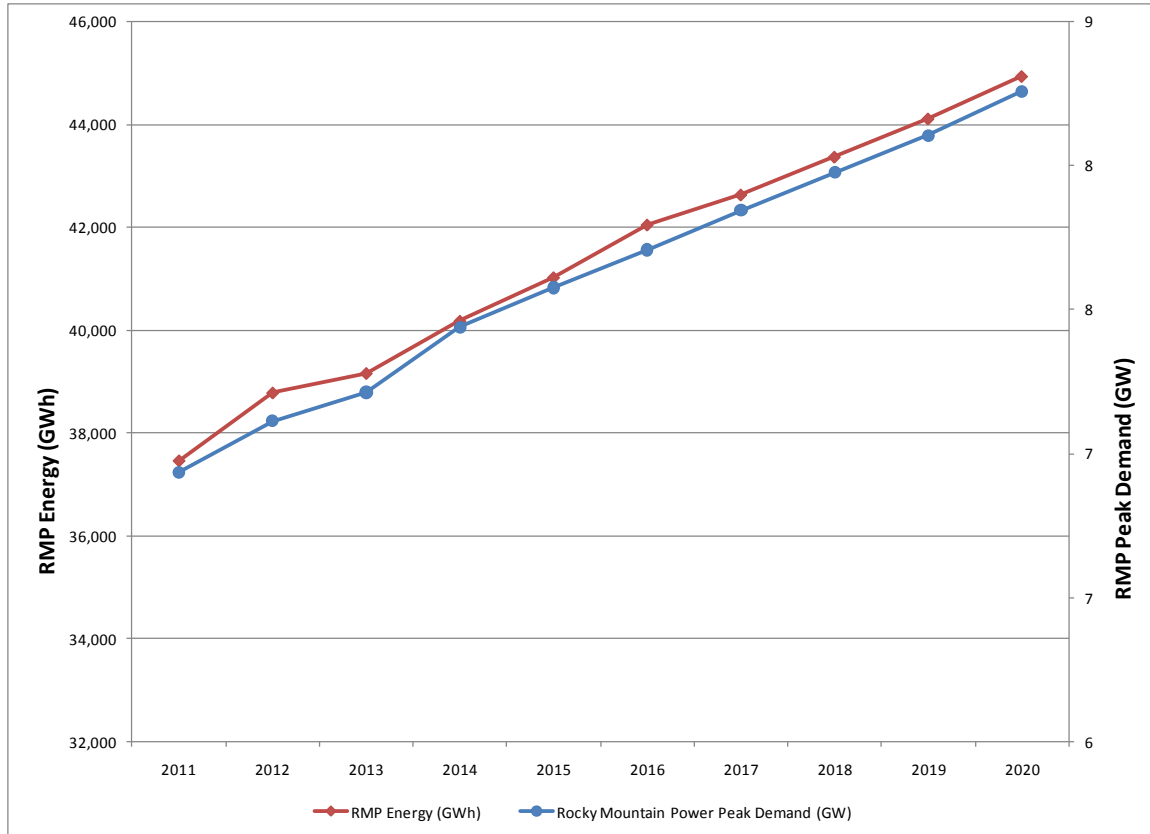


Figure 3 – Forecast Growth of Rocky Mountain Power’s Energy Delivery and Peak Demand

The Company’s transmission business operates independently of its merchant function and markets its transmission services using an Open Access Same-time Information System (OASIS). The Company’s wholesale transmission services are regulated by FERC under cost-based regulation subject to the Company’s OATT, which requires it to provide transmission service to eligible wholesale customers. Therefore, in addition to ensuring transmission capacity is available to meet the needs of its retail customers, the Company has an obligation to ensure sufficient transmission capacity is available to meet the growing needs of its third-party network customers.

The Company currently has approximately 12,500 MW of existing resources (Figure 4), and its 10-year planning forecast predicts it will need approximately 15,000 MW, including reserves, by 2020. As demonstrated in Figure 4, there will be a deficit in existing resources due to a combination of retiring generation resources, expiring energy and capacity contracts, and growth in existing and new customer demand for energy that will result in an energy capacity resource gap of 3,852 MW. Furthermore, the Company’s eastern-system peak is expected to continue growing faster than the western-system peak, with average annual growth rates of 2.4 percent and 1.4 percent, respectively, over the forecast horizon.

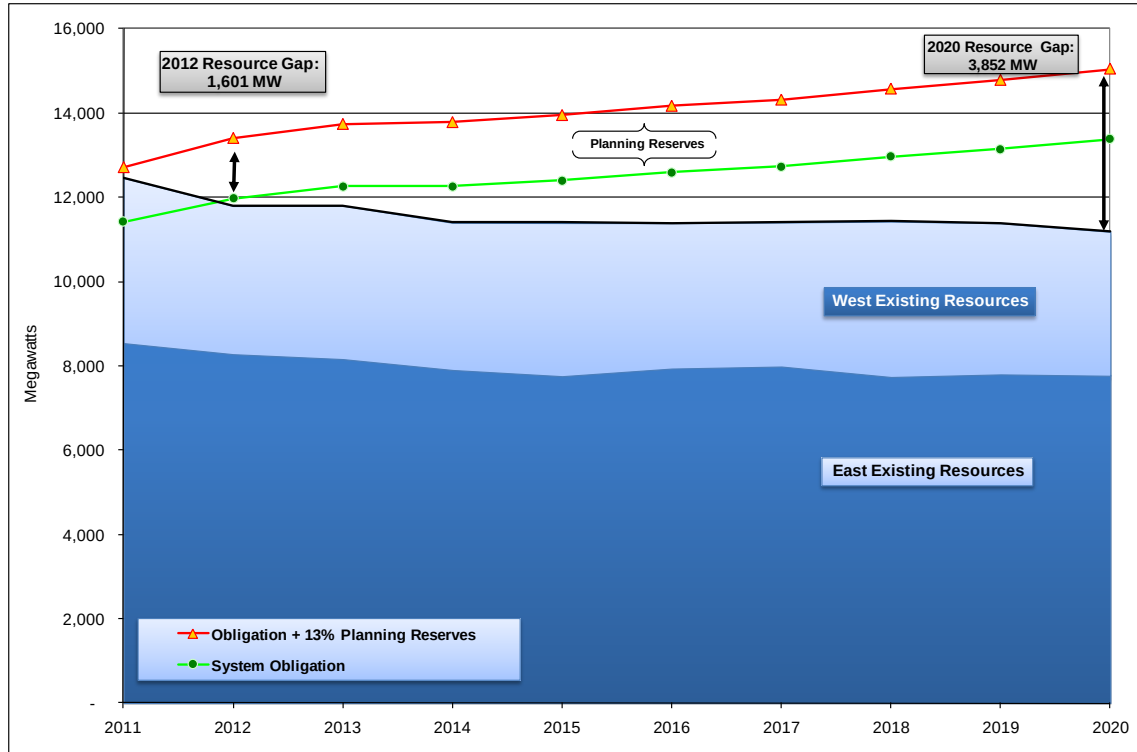


Figure 4 – System Capacity Resource Gap (PacifiCorp 2011 IRP)

Existing Transmission Capacity, Constraints, and Regional Planning

Capacity refers to the amount of power a transmission line can reliably deliver. Capacity is measured in MWs and is limited by the current (in amperes) that the wire can carry or the minimum voltage levels delivered to the substations. Multiple transmission lines generally located in similar alignments and operating electrically in parallel are referred to as electrical transmission “paths.” The capacity ratings of the paths are based on meeting established reliability criteria. The Company’s high-voltage transmission system is composed of multiple 230kV, 345kV, and 500kV segments. Based on current projections, loads, and the dynamic blend of energy resources are expected to become more complex over the next 20 years, which will challenge the existing capabilities of the transmission network. The Company along with other regional utilities has determined that the Western Interconnection requires additional transmission facilities to meet increased demand for electrical transmission, including the accommodation of multiple renewable-generation projects.

Transmission reliability and the ability to address capacity or congestion issues in a timely manner represent important planning considerations for ensuring that peak load and energy obligations are met on a reliable basis. The cycle time to add significant transmission infrastructure is often longer than adding generation resources or securing third-party resources. Transmission additions must be integrated into regional plans and then permits must be obtained to site and construct the physical assets. Inadequate transmission capacity limits the ability to access what would otherwise be cost effective generating resources.

In the Western Interconnection, regional planning has evolved into a three-tiered approach where an interconnection-wide entity, in this case WECC, conducts regional planning at a very high level, several sub-regional planning groups focus with greater depth on their specific areas, and transmission providers perform local planning studies within their sub-region. This coordinated planning helps to ensure that

customers in the region are served reliably and at the least cost. The Company is one of the founding members of the Northern Tier Transmission Group (NTTG). Originally formed in early 2007, NTTG has an overall goal of improving the operation and expansion of the high-voltage transmission system that delivers power to consumers in seven western states. The NTTG footprint includes approximately 4.3 million customers and more than 29,000 miles of transmission lines within Oregon, Washington, California, Idaho, Montana, Wyoming, and Utah.

Repeated sub-regional studies have concluded the critical need to alleviate transmission congestion and move transmission-constrained energy resources to regional load centers. These include the Rocky Mountain Area Transmission Study dated September 2004, the Western Governors' Association Transmission Task Force Report dated May 2006, and the NTTG Fast Track Project Process in 2007, the Transmission Expansion Planning Policy Committee (TEPPC) 2009 Annual Report, the 2009 TEPPC Western Interconnection Transmission Path Utilization Study, plus subsequent the Company planning studies. In addition, the WECC Seams Steering Group-Western Interconnection (SSG-WI) of 2005 analyzed this region, and its results were included in the 2006 U.S. Department of Energy (DOE) National Electric Transmission Congestion Study (DOE 2006). The 2006 DOE study identifies the region from Wyoming to the west as a conditional constrained area, meaning that any generation developed in Wyoming will require additional transmission. These studies helped inform the design of the Company's recommended bulk electric transmission additions, which took on a consistent footprint establishing a triangle over Idaho, Utah, and Wyoming, with paths extending into Oregon and Washington. The footprint defined by these studies is now known as Energy Gateway. Studies also were performed in 2007 through the NTTG Fast Track Project Process and as part of the approved NTTG 2011 Biennial Transmission Plan, which indicated a strong need for a series of independent transmission segments, each of which addresses an independent purpose, though all are part of the larger grid. Gateway South is an important component of the needed grid expansion identified by that planning effort.

All of these studies show that the existing generation is using all of the transmission capacity from Wyoming and that the addition of generation resources will require more transmission capacity. These studies also show that the cost of generation and transmission in Wyoming is typically much less than energy from other locations.

On a broader scale, the DOE also sponsored a study through Idaho National Laboratories to assess the economic impact of *not* building transmission upon the Pacific Northwest. The report was published in July 2008 and used a preliminary engineering review and analysis of planned transmission projects to preliminarily rank the projects based on estimates of their potential economic value, likelihood of execution, resource area(s) being accessed, size, and value to the transmission system as a whole. Although the Project's primary purpose is to serve customers in Utah and the Southwest, it ranked 5th (of 15 major projects) in importance for the Pacific Northwest⁵. This conclusion provides a strong indicator that the Project is important on both a local and regional scale.

2.4 Need to Ensure Reliability

Transmission systems in the United States must be planned, operated, and maintained according to NERC⁶ reliability standards. All system planners, users, owners, and operators of the bulk-power system

⁵Idaho National Laboratory: The Cost of Not Building Transmission (2008).

⁶NERC's mission is to improve the reliability and security of the bulk power system in North America. To achieve that, NERC develops and enforces reliability standards; monitors the bulk power system; assesses future adequacy; audits owners, operators, and users for preparedness; and educates and trains industry personnel. NERC is a self-regulatory organization that relies on the diverse and collective expertise of industry participants. As the Electric

and regional entities must comply with these reliability standards or face significant penalties for noncompliance. Regionally, the Company also is governed by WECC⁷ standards and criteria, which may be more stringent than those required by NERC. Compliance with these standards requires transmission systems to be planned and constructed with sufficient levels of redundancy to maintain reliable operation in the event of a loss or outage of system elements (i.e., transmission line segment or substation element). NERC and WECC performance requirements also require detailed risk assessments of system impacts that would result from a multitude of outage scenarios. Compliance with these standards and regional criteria is not optional for the Company as a Transmission Owner and Transmission Planner under NERC registration.⁸

The NERC and WECC standards and criteria are performance-based. Therefore, they do not dictate the site-specific locations of proposed transmission lines. The physical arrangement of new and existing lines and corridors is left to the transmission provider because it is most knowledgeable about the best method to meet system performance requirements and manage reliability risks and costs. Should a transmission provider fail to meet NERC standards and WECC criteria resulting in widespread uncontrolled loss of generation or customer demand, it would be required per WECC System Performance Criteria TPL-001 WECC-CR-2, WRS5, to take action “so that future occurrences of the event will not result in cascading, or it must demonstrate that the MTBF is greater than 300 years (frequency less than 0.0033 outages/year) and approved by PCC.” Severe measures would be required to meet this elevated level of required system performance.

NERC Transmission Planning Standard TPL 002 states that “system simulations and associated assessments are needed periodically to ensure that reliable systems are developed that meet specified performance requirements with sufficient lead time, and continue to be modified or upgraded as necessary to meet present and future system needs.”

This means the Company must have a forward-looking transmission plan of action to reliably serve current and anticipated future customer demands under all expected operating conditions, including normal system operations (all system elements in service) and during system contingencies (where elements of the transmission system are out of service), both planned or unplanned.

Collectively these standards are designed to protect the West’s interconnected electrical grid by dictating minimum performance levels of transmission system reliability for projects like this Project. In the event

Reliability Organization, NERC is subject to audit by the FERC and governmental authorities in Canada (NERC 2008).

⁷WECC and the nine other NERC regional reliability councils were formed due to national concern regarding the reliability of the interconnected bulk power systems, the ability to operate these systems without widespread failures in electric service, and the need to foster the preservation of reliability through a formal organization. WECC’s service territory extends from Canada to Mexico. It includes the provinces of Alberta and British Columbia, the northern portion of Baja California, Mexico, and all or portions of the 14 western states in between (WECC 2008a).

⁸NERC and WECC standards and criteria that apply to the Company’s transmission system and design of the Project include but are not limited to:

- [NERC TPL-001](#) – System Performance Under Normal Conditions
- [NERC TPL-002](#) – System Performance Following Loss of a Single BES Element
- [NERC TPL-003](#) – System Performance Following Loss of Two or More BES Elements
- [NERC TPL-004](#) – System Performance Following Extreme BES Events
- [TPL 001-WECC-1-CR](#) – System Performance Criteria Normal Conditions
- [TPL 002-WECC-1-CR](#) – System Performance Criteria Following Loss of a Single BES Element
- [TPL 003-WECC-1-CR](#) – System Performance Criteria Following Loss of Two or More BES
- [TPL 004-WECC-1-CR](#) – System Performance Criteria Following Extreme BES Events

that the Company's new transmission line fails to perform in accordance with these reliability requirements, the Company may be required by WECC and NERC to limit the capacity or operation of the lines to levels that would not cause major disturbances or disruptions to the Western Interconnection. Therefore, the Project has been designed such that a common-mode outage would not result in a reduction of its rated capacity (de-rating). This approach protects the Company's ability to maintain its obligations to its native load and network customers and minimizes the risk of a de-rating. If the Project were subject to a de-rating, then the Company would be required to mitigate for the lost capacity. Given the scale of the Project, this scenario would require the design and construction of an additional 500kV transmission facility.

2.4.1 WECC Planning Studies to Establish Line Ratings

The WECC rating studies are required to account for outages or, in other words, events and circumstances that are deemed credible based on the utility’s system operating experience and history. Within the Project area, there are other existing and planned EHV lines that the Company must consider when siting the proposed Project. If the proposed Project and the other EHV lines are all colocated in proximity then the Company must be able to demonstrate it has an acceptable back-up plan in place should they be simultaneously out of service for any reason.

For the Company to reliably serve immediate future loads within its service area, a new transmission line needs to be designed such that it meets NERC and WECC planning and reliability criteria. However, meeting these planning criteria does not relieve the Company of other performance-based standards enforced by WECC. In particular if a severe system disturbance occurs due to line outages, the Company’s experience demonstrates that WECC may reduce the line ratings and useable capacity in order to restore system reliability. Under such a scenario, the Company would expect that construction of a new line would be needed to make up for the lost capacity.

2.4.2 Use of Federally Designated Corridors

As part of its original feasibility analysis, the Company considered routes in federally designated corridors located within the Project area, but suggested the removal of some routes from further consideration based upon many factors, including its fundamental need to comply with NERC and WECC requirements. The West-wide Energy Corridors (WVEC) Programmatic Environmental Impact Statement (PEIS) published by the Department of Energy, Bureau of Land Management, and Forest Service confirms that compliance with NERC and WECC standards is essential to reliability.⁹

The WVEC PEIS concludes that “...by far the most cost effective preemptive strategy against multiple simultaneous line loss involves ensuring adequate distance separation between lines at the planning stage. Experience among WECC system operators has also shown that the nature of the land between lines...should dictate safe separation distances on a case-by-case basis...[I]n forested areas or in areas where vegetation provides substantial amounts of fuel for fires, greater line spacings (up to 5 miles) may be necessary to prevent adjacent lines from becoming simultaneously involved in faults caused by ionized smoke.”

The Company’s planning for the Project, therefore, incorporates the findings of the WVEC PEIS as well as its own experience.

⁹Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Land in 11 Western States (DOE/EIS-0386); DOE 2008

2.4.3 Company and Industry Experience

As described above, the Company is required to use its experience when planning for new facilities. The Company has more than 100 years of experience with instances of multiple transmission lines located in the same general proximity experiencing simultaneous outages due to a variety of causes, including but not limited to fire and smoke, high winds, dust storms, ice storms, blizzards, lightning, landslides, earthquakes, vandalism, tower or conductor failure, equipment failure, airplane collisions, and other experience. The following examples demonstrate the need for the Company and the affected land-management agencies (e.g., Bureau of Land Management, Forest Service) to consider separation distances during the planning, design, and siting of the Project as a means to reduce risk to system reliability in the planning and construction of new transmission lines:

- **1981.** Fire forced two 345kV lines north of Camp Williams out of service and a third 345kV line cascaded, resulting in a Utah state-wide blackout.
- **1982–1983.** Landslides destroyed transmission towers on the two Emery to Sigurd 345kV lines.
- **1983.** Severe winds destroyed sections of seven lines between Salt Lake City and Ogden (345kV, 230kV and 138kV)
- **1990.** A U.S. Air Force jet clipped an overhead shield wire, which wrapped around the double-circuit 345kV and 230kV lines between Terminal and Ben Lomond substations, causing outages.
- **2000.** Fires in the corridor of Emery to Camp Williams and Huntington to Spanish Fork lines forced 345kV lines out of service.
- **2002–2003.** Multiple fires in the corridor between Mona and Camp Williams forced lines out of service.
- **2007.** Fire caused both the Mona to Huntington and Mona to Bonanza 345kV lines in Central Utah to be de-energized for fire crew safety.
- **2007.** Fire forced three 345kV lines connecting Jim Bridger in Wyoming and southeast Idaho out of service.

In addition to the Company’s experience, other utilities in the WECC have experienced significant system outages:

- **1990.** Fires caused six simultaneous outages (along with 17 single-line outages) of two Round Mountain to Table Mountain 500kV lines in northern California. Fires burned randomly back and forth across the corridor for more than 12 miles. Customer load interruptions ranged from 90 MW to 1,000 MW at times.
- **1993.** High winds caused the loss of two adjacent 500kV line towers on the Pacific Intertie, leaving an estimated 5.2 million customers in several states without power. This simultaneous loss of two major EHV lines resulted in a system reliability and capacity review that led to the requirement in 1993 to build a third 500kV transmission line across the Pacific Intertie to restore capacity and improve reliability.

PROJECT DESCRIPTION

This document provides detailed information provided by PacifiCorp (doing business as Rocky Mountain Power, the Company), the applicant for right-of-way across federal land, regarding the components of the transmission system evaluated in the environmental impact statement (EIS), including the transmission structures, the communications system, and the substations. These component descriptions apply to all the alternative routes, and throughout this document, a reference to a segment includes the alternative routes for that segment.

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LIST OF ACRONYMS

AC	Alternating current
ANSI	American National Standards Institute
ATV	All-terrain vehicle
CPT	Cone penetration test
EIS	Environmental impact statement
FAA	Federal Aviation Administration
IEEE	Institute of Electrical and Electronics Engineers
IRP	Integrated Resource Plan
kV	Kilovolt
MW	Megawatt
NEPA	National Environmental Policy Act of 1969
NERC	North American Electricity Reliability Council
NESC	National Electrical Safety Code
OATT	Open access transmission tariff
OHGW	Overhead ground wire
OPGW	Optical ground wire
POD	Plan of Development
ReMi	Refraction microtremor
WECC	Western Electricity Coordinating Council

1 INTRODUCTION

This appendix contains information provided by PacifiCorp (doing business as Rocky Mountain Power, the Company), applicant for right-of-way across federal land for construction, operation, and maintenance of the Energy Gateway South Transmission Project (Gateway South or Project). This appendix provides detailed information regarding the scope of work and components of the transmission system evaluated in the environmental impact statement (EIS) for the Project, including the transmission structures, communications system, and substations and series compensation stations. The component descriptions (Section 1.0) apply to the transmission segments and substation descriptions. It provides details regarding the system components (Section 2.0) and construction of the system (Section 3.0), provides information regarding the operations and maintenance of the system (Section 4.0), and decommissioning (Section 5.0).

The Project is part of the Company's transmission expansion program, called Energy Gateway, which is intended to add new transmission lines connecting new and existing generation resources to customers throughout the Company's service territory. Energy Gateway is composed of several large-scale projects that will address customers' increasing electric energy use and improve system reliability.

The Project is designed to provide 1,500 megawatts (MW) of new capacity needed to meet the current and forecasted needs of the Company's customers. These forecasts are based on the Company's 2013 Integrated Resource Plan (IRP) as required to fulfill the regulatory requirements and guidelines established by the public utility commissions of the states served by the Company. The IRP addresses the obligations of each company pursuant to its open access transmission tariff (OATT) to plan for and expand its transmission system in a nondiscriminatory manner based on the needs of its native load and network customers.

Gateway South is independent of, and would be built regardless of, any particular new generation or transmission project(s). The transmission grid, of which it would become a part, can be thought of in terms of hubs, spokes, and a backbone connecting the hubs. Each substation is a hub, and receives or sends electricity along the spokes. For this system to work, a backbone of high-capacity transmission lines is needed to connect the hubs and transport the electricity to where it is needed.

The purpose of the transmission line is to satisfy several distinct, yet inter-related needs, explained above. The purposes of the Project relative to meeting these needs are summarized below:

- Provide long-term transmission capacity to move resources to growing load centers
- Connect Gateway West and Gateway Central, providing operational flexibility for the bulk electric network, reliability, and supports path ratings for each segment
- Improve capacity and reliability of other interconnected transmission lines associated with Energy Gateway
- Reduce transmission limitations on the existing system
- Provide incremental transmission capacity planned at approximately 1,500 MW

As proposed, the Project would be comprised of an extra-high-voltage alternating current (AC) transmission line that would run between planned, proposed, and existing substations. A proposed single-circuit 500-kilovolt (kV) transmission line approximately 400 to 540 miles in length (depending on the alternative route chosen) would begin at the planned Aeolus Substation (planned as part of Gateway West) near Medicine Bow, Wyoming; connect to two separate, proposed series compensation substations;

and terminate at the existing Clover Substation (built as part of Gateway Central) near Mona, Utah. The two proposed series compensation substations would be located at approximately the one-third and two-thirds points of the transmission line between the Aeolus and Clover substations. Modifications at the existing Mona Substation are required to re-terminate existing lines to accommodate the nearby 500kV termination at Clover Substation.

1.1 Transmission Segment Descriptions

A schematic diagram of the Project segments described below is provided as Figure 1 – Project Layout Diagram.

1.1.1 Segment 1 Aeolus – Series Compensation Substation No. 1

Segment 1 is composed of one single-circuit 500kV transmission line¹ proposed between the planned Aeolus Substation near Medicine Bow, Wyoming, and the proposed Series Compensation Substation No. 1. The location of Series Compensation Substation No.1 would be dependent on the transmission-line route selected.

1.1.2 Segment 2 Series Compensation Substation No. 1 – Series Compensation Substation No. 2

Segment 2 is composed of one single-circuit 500kV transmission line proposed between the proposed Series Compensation Substation No. 1 and the proposed Series Compensation Substation No. 2. The location of Series Compensation Substation No. 2 would be dependent on transmission-line route selected.

1.1.3 Segment 3 Series Compensation Substation No. 2 – Clover Substation

Segment 3 is composed of one single-circuit 500kV transmission line proposed between the proposed Series Compensation Substation No. 2 and the Clover Substation. The location of Clover Substation is near Mona, Utah.

1.1.4 Segment 4a Clover Substation – Mona Substation No. 1

Segment 4a consists of rebuilding the single-circuit portion of the Clover – Mona 345kV No. 1 transmission line between the Clover Substation and the Mona Substation. The line is approximately 3 miles in length and would be rebuilt on existing right-of-way.

1.1.5 Segment 4b Clover Substation – Mona Substation No. 2

Segment 4b consists of rebuilding the single-circuit portion of the Clover – Mona 345kV No. 2 transmission line between the Clover Substation and the Mona Substation. The line is approximately 3 miles in length and would be rebuilt on existing right-of-way.

¹ A single-circuit transmission line (whether 345kV or 500kV) is composed of three electrical phases and two lightning protection shield wires. One of the lightning-protection shield wires is a steel overhead ground wire (OHGW), and the other is typically an optical ground wire (OPGW). The OPGW contains glass fibers used for communication along the fiber path for data transfer between the Company's facilities. The data transferred is required for system control and monitoring.

1.1.6 Segment 4c Mona Substation – Huntington Substation

Segment 4c consists of rerouting the existing Mona – Huntington 345kV transmission line into the Clover Substation and then out of the substation headed north to the Mona Substation. This reroute would involve construction of two new single-circuit 345kV transmission-line segments extending off the existing route, approximately 1 mile in length each.

A new transmission-line corridor would be needed for the north-south portion of the new line between the Mona Substation and Clover Substation, north of the Clover Substation. Also, a new transmission corridor would be needed for a new alignment extending east-west from the existing Mona – Huntington 345kV line into the existing Clover Substation. Existing/abandoned structures would be removed when the new transmission lines are placed in service.

1.2 Substation Descriptions

1.2.1 Aeolus Substation

This planned substation will be built as part of the Gateway West and a single 500kV dead-end structure will be constructed inside that substation for this Project. Major facility/equipment additions to be installed at Aeolus Substation for Gateway South include, but are not limited to, substation steel dead-end structures and bus work. It is anticipated that all work involved with terminating the Gateway South 500kV line would be performed within the substation fence as proposed by Gateway West.

1.2.2 Series Compensation Substation No. 1

Construction of proposed Series Compensation Substation No. 1 would consist of installation of circuit breakers and related switching equipment, bus supports, and other equipment to be installed for the 500kV transmission-line structures. Additional equipment, including 500kV series capacitors, shunt-reactor banks, and emergency generators along with all associated site preparation, fencing, foundations, protection, control, communications equipment, and metering would be installed. Locations for the series compensation stations have not yet been identified, but would be located approximately one-third the distance from the Aeolus Substation to the planned Clover Substation. Based on the Company's preferred route of approximately 400 miles, this places this station approximately 133 miles from Aeolus Substation.

1.2.3 Series Compensation Substation No. 2

Construction of proposed Series Compensation Substation No. 2 would consist of installation of circuit breakers and related switching equipment, bus supports, and other equipment to be installed for the 500kV transmission-line structures. Additional equipment, including 500kV series capacitors, shunt-reactor banks, and emergency generators along with all associated site preparation, fencing, foundations, protection, control, communications equipment, and metering would be installed. Locations for the series compensation stations have not yet been identified, but generally would be located approximately two-thirds the distance from the planned Aeolus Substation to the planned Clover Substation. Based on the Company's preferred route of approximately 400 miles, this places this station approximately 133 miles from both Clover Substation and Series Compensation Station No. 1.

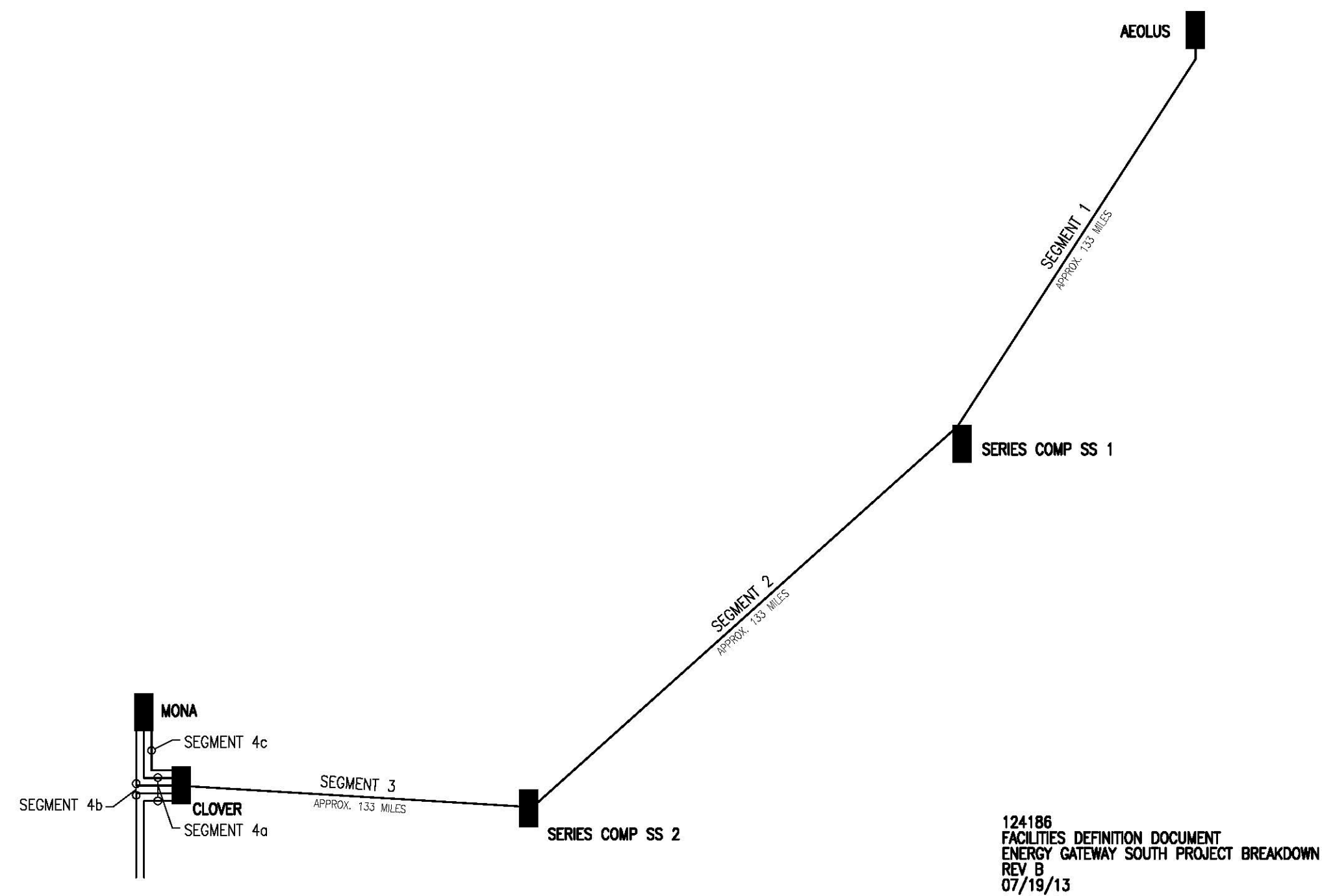
1.2.4 Clover Substation

Clover Substation is an existing facility of Gateway Central and has been permitted and assessed under previous National Environmental Policy Act (NEPA) documentation. Expansion of the existing facility, within the area previously permitted and assessed, is necessary to accommodate the equipment required to terminate the new 500kV and 345kV transmission lines into the substation. Major facility/equipment additions to Clover Substation include, but are not limited to, 500kV and 345kV related equipment; i.e., circuit breaker(s), shunt capacitor(s), series capacitor(s), and shunt reactor(s) along with all associated site preparation, fencing, foundations, steel substation towers, bus work, and protection and control metering.

1.2.5 Mona Substation

Changes to the existing Mona Substation occurring within the existing fence line include installation of new circuit breakers, protective relaying metering, substation structural members, and bus work to upgrade the Mona to Clover No. 1 and No. 2 transmission line bays. For Gateway South, it is anticipated that the current footprint of the Mona Substation will remain the same with no expansion of the substation required.

Figure 1 Project Layout Diagram



2 SYSTEM COMPONENTS

This section describes the various components of the transmission system for the Project, including the structures themselves, conductors used, other hardware needed, communication system, access to right-of-way, and, finally, the substations. Both the proposed and alternative structures are described below.

2.1 Transmission Structures

2.1.1 Types of Transmission Line Support Structures

The proposed transmission line circuits typically would be supported by the following types of structures: self-supporting single-circuit lattice steel and steel H-frame 500kV structures and steel H-frame, steel mono-pole single-circuit, and/or steel mono-pole double-circuit 345kV structures. Tangent structures are designed to support the conductors where the transmission-line angle at the structure location is typically 1 degree or less, meaning the transmission line is essentially a straight line. Very similar structures by appearance support the line at line angle (direction changes) up to about 30 degrees. A structure with more complex insulator assemblies and heavier/stronger structures would be used when line angles are greater than 30 degrees.

500-KILOVOLT STEEL STRUCTURES

Lattice-steel structures, Figure 2, would be fabricated with galvanized steel members treated to produce a dulled galvanized finish. The average distance between 500kV structures, or span, would be 1,000 to 1,500 feet with occasional longer spans in rough terrain. Structure heights would vary depending on terrain and the requirement to maintain minimum conductor clearances from ground. The 500kV single-circuit structures would vary in height from 145 to 200 feet.

H-frame steel structures, Figure 3, would be fabricated as tubular self-weathering steel treatment to produce a rust-like finish. The average distance between 500kV structures would be 1,200 to 1,300 feet. Structure heights would vary depending on terrain and the requirement to maintain minimum conductor clearances from ground. The 500kV single-circuit H-frame structures would vary in height from 100 to 165 feet.

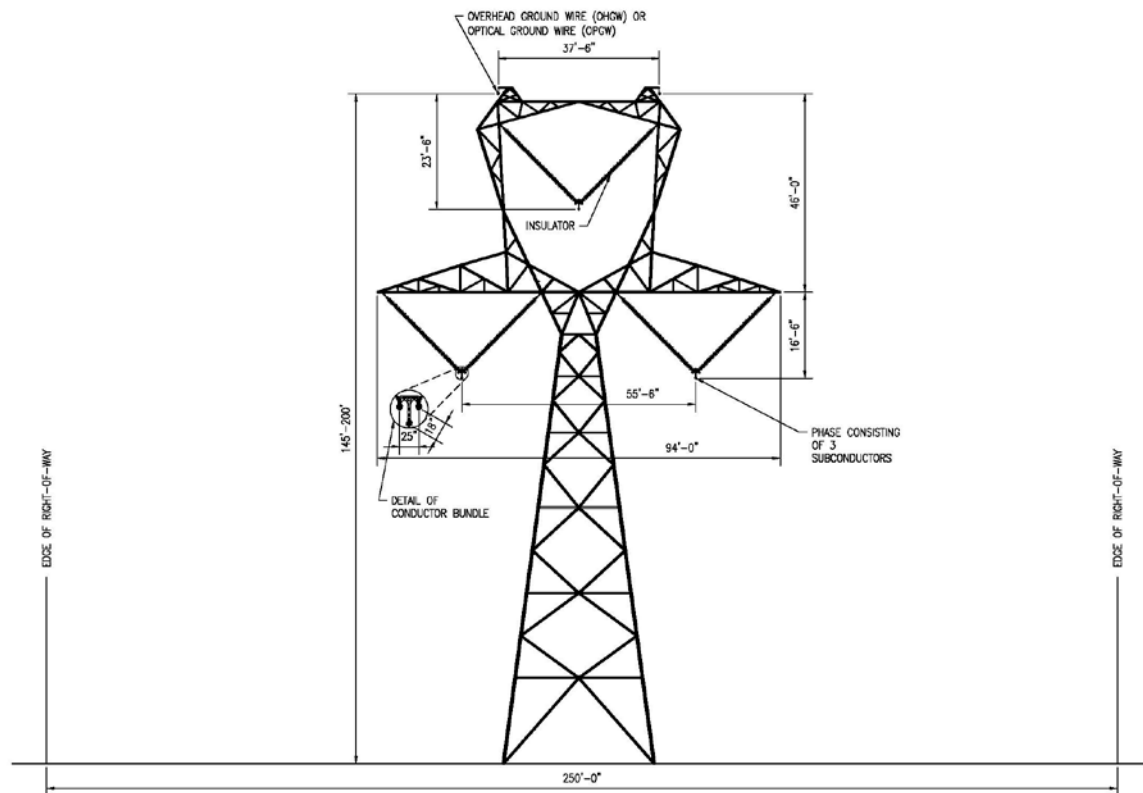


Figure 2 Proposed Tangent Single-circuit 500-kilovolt Lattice Steel Structure

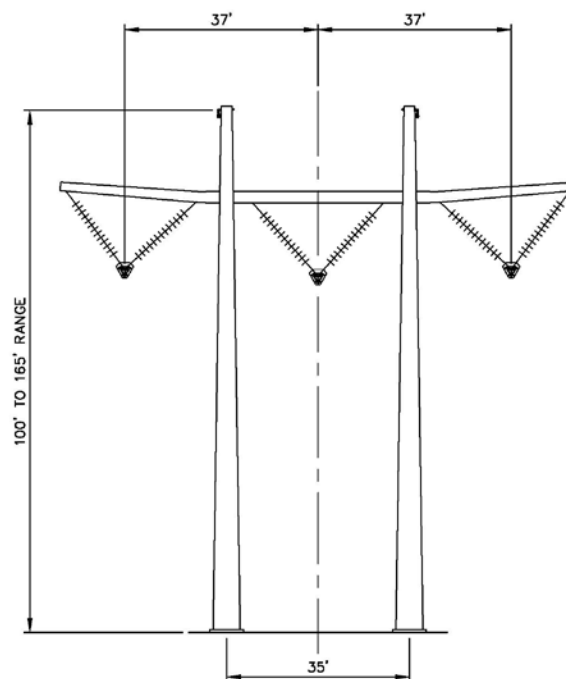


Figure 3 Proposed Tangent Single-circuit 500-kilovolt H-frame Structure

345-KILOVOLT STEEL STRUCTURES

The two existing and one proposed 345kV single-circuit transmission lines between the Clover and Mona substations (Segments 4a, 4b, and 4c) would use steel H-frame, steel mono-pole single circuit, and/or steel mono-pole double circuit 345kV structures (Figures 4, 5 and 6).

The 345kV structures would be steel H-frame, steel mono-pole single-circuit or steel mono-pole double-circuit structures depending on final design requirements. The steel H-frame structures would use self-weathering steel or a dulled galvanized steel finish. Weathering steel is manufactured from a group of steel alloys that were developed to eliminate the need for maintenance painting. This type of steel alloy forms a stable dark red-brown rust-like appearance after exposed to the weather for a few years. The average distance between H-frame structures would be approximately 800 to 1,200 feet. Typically, the 345kV single-circuit H-frame structures would have pole lengths ranging between 80 and 140 feet. Embedment depths are typically 10 percent of the pole length plus 5 feet, which in the case of this Project is expected to range between 13 and 19 feet.

The average span between single-circuit monopole structures would be approximately 700 to 800 feet. Structures would be set on a drilled-pier foundation. The structure heights above ground would vary from 85 to 130 feet.

The average distance between double-circuit monopole structures would be approximately 700 to 800 feet. Structures would be set on a drilled-pier foundation. The structure heights above ground would vary from 95 to 150 feet.

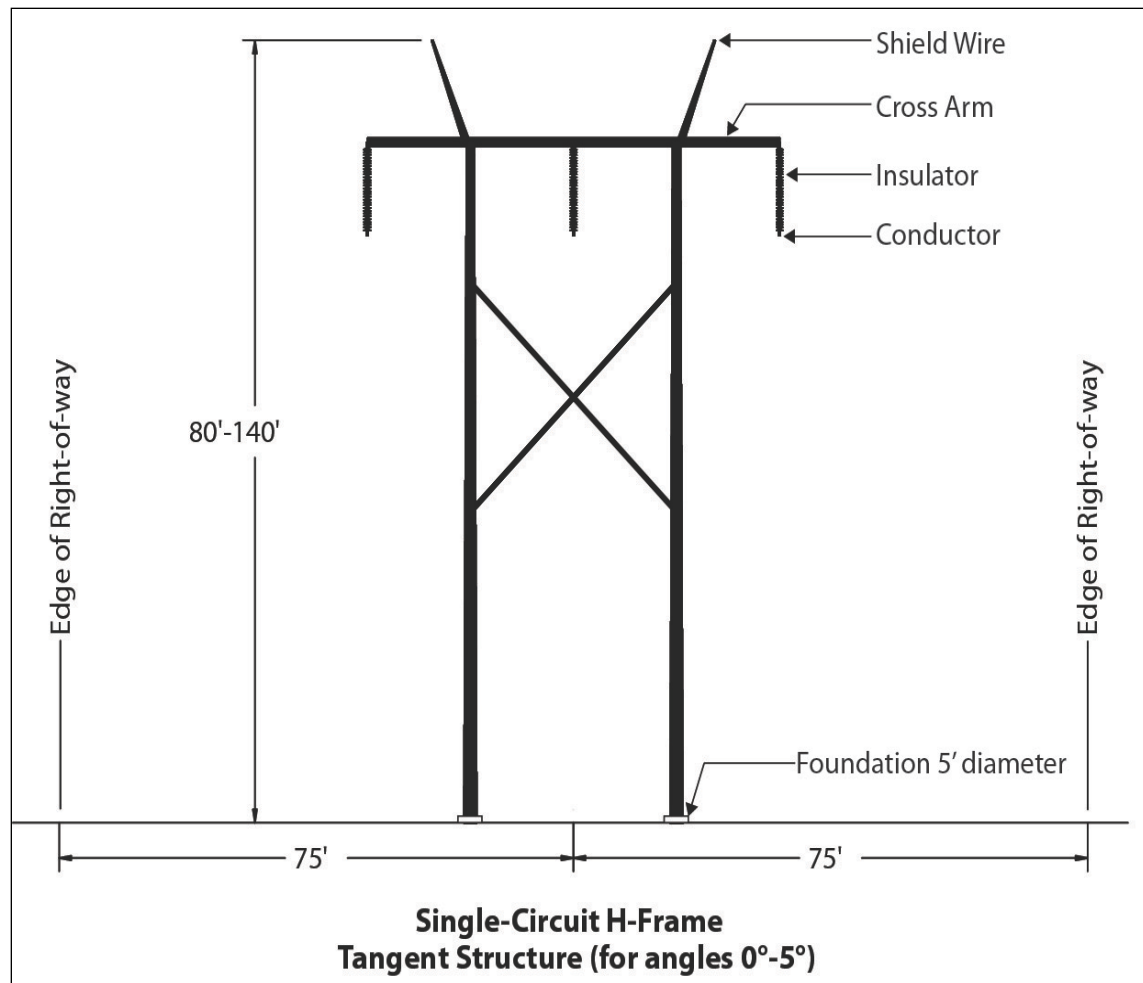


Figure 4 Proposed Tangent Single-circuit 345-kilovolt H-frame Structure

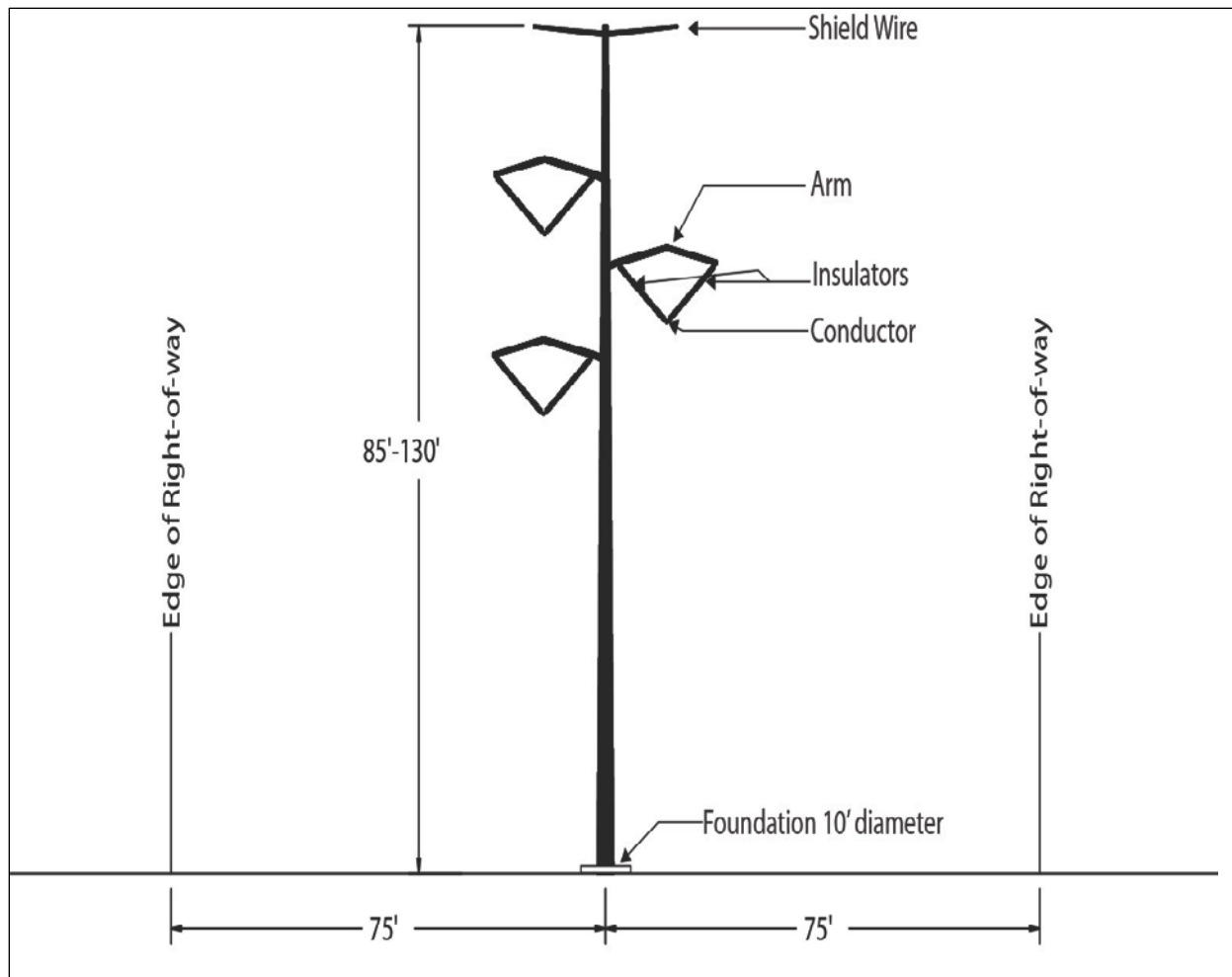


Figure 5 Proposed Single-circuit 345-kilovolt Mono-pole Tangent Structure (for angles 0°–5°)

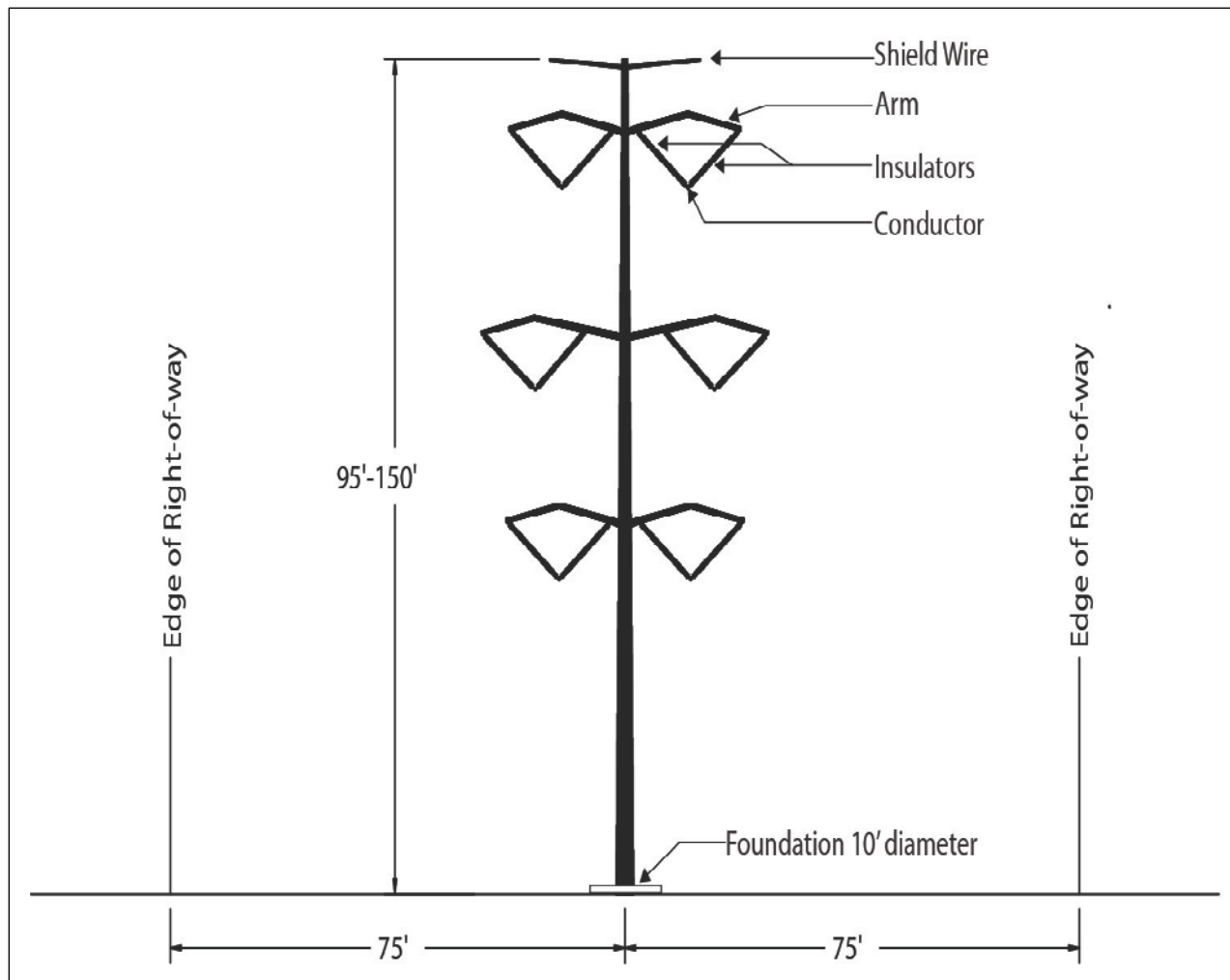


Figure 6 Proposed Double-circuit 345-kilovolt Mono-pole Tangent Structure (for angles 0°–5°)

2.1.2 Structure and Conductor Clearances

Conductor phase-to-phase and phase-to-ground clearance parameters are determined in accordance with the National Electrical Safety Code (NESC), ANSI C2, produced by the American National Standards Institute (ANSI) and are often supplemented by PacifiCorp's own standards that further address safety and performance criteria. The NESC code provides for minimum distances between the conductors and ground, crossing points of other lines and the transmission support structure and other conductors, and minimum working clearances for personnel during energized operation and maintenance activities (Institute of Electrical and Electronics Engineers [IEEE] 2007). Typically, the clearance of conductors above ground is no less than 35 feet for 500kV and no less than 30 feet for 345kV. During detailed design, clearances may be increased to account for localized and special conditions.

2.1.3 Structure Foundations

The 500kV single-circuit lattice-steel self-supported structures each require four foundations with one on each of the four corners of the lattice structures. The 500kV H-frame requires two foundations, one foundation for each tubular steel leg. The foundation diameter and depth for both steel-lattice and H-frame structures would be determined during final design and are dependent on the type of soil or rock present at each site; typical diameters and depths of foundation are shown in Table 1. Typically, the foundations for the self-supported single-circuit tangent lattice and H-frame structures would be composed of steel-reinforced concrete drilled piers.

Structure Type	Number of Foundations	Foundation Diameter (feet)	Foundation Depth (feet)	Area of All Foundations (square feet)
Tangent lattice	4	4.0	21.0	52.0
Small angle lattice	4	4.0	27.0	52.0
Medium angle lattice	4	4.0	30.0	52.0
Medium dead-end lattice	4	5.0	36.0	80.0
Heavy dead-end lattice	4	5.0	41.0	80.0
Tangent H-frame tubular steel	2	6.0	25.0	57.0
Angle H-frame tubular steel	2	7.0	30.0	77.0
Dead-end H-frame tubular steel	2	8.0	40.0	100.0

Depending on soil and tubular-steel structure type, the 345kV foundations would be either drilled-pier foundations or directly embedded. Typically, the tangent (no line angle change) 345kV single-circuit H-frame structures are directly embedded into the ground and do not require concrete foundations. The embedment depth is typically 10 percent of the pole length plus 5 feet. The diameter of the hole excavated for embedment is typically the pole diameter plus 18 inches. When a pole is placed in a hole, native or select backfill would be used to fill the voids around the perimeter of the hole.

Monopole 345kV single- and double-circuit structures would use a drilled-pier foundation. The foundation diameter and depth would be determined during final design and are dependent on the type of soil or rock present at each specific site. Typical foundation diameters and depths for the single-circuit and double-circuit mono-pole structure families are shown in Table 2.

Table 2 Typical 345-kilovolt Structure Type Foundations				
Structure Type	Number of Foundations	Foundation Diameter (feet)	Foundation Depth (feet)	Area of All Foundations (square feet)
Single Circuit				
Tangent H-frame	2	4.0	18.0	26.0
Tangent monopole	1	7.0	24.0	39.0
Small angle monopole	1	7.5	26.0	45.0
Medium dead-end lattice	1	4.0	20.0	13.0
Heavy dead-end lattice	1	4.0	25.0	13.0
Double Circuit				
Tangent monopole	1	8.5	32.0	57.0
Small angle monopole	1	9.0	34.0	64.0
Medium dead-end monopole	1	10.5	40.0	87.0
Heavy dead-end monopole	1	12.0	45.0	114.0

2.2 Conductors

2.2.1 Conductors for Segments 1, 2, and 3

The proposed conductor for the 500kV lines is 1,949.6 kcmil² 42/7 ACSR/TWD, “Athabaska/TW”³. Each phase of a 500kV three-phase circuit⁴ would be composed of three sub-conductors in a triple bundle configuration. The individual 1,949.6 kcmil conductors would be bundled in a triangular configuration with spacing of 18 and 25 inches between sub-conductors (see Figure 11). The triple-bundled configuration is proposed to provide adequate current carrying capacity and to provide for a reduction in audible noise and radio interference as compared to a single large-diameter conductor. Each 500 kV sub-conductor would have a 42/7 aluminum/steel stranding, with an overall conductor diameter of 1.504 inches and a weight of 2.199 pounds per foot and a nonspecular finish⁵.

2.2.2 Conductors for Segments 4a and 4b

The proposed conductor for the 345 kV lines, (Segments 4a, and 4b) is 1,272 kcmil 45/7 ACSR “Bittern.” Each phase of the 345kV three-phase circuit would be composed of two sub-conductors. The individual 1,272 kcmil conductors would be bundled in a vertical configuration with spacing of 18 inches. The double-bundle configuration is proposed to provide adequate current carrying capacity and to provide for a reduction in audible noise and radio interference when compared to a single large-diameter conductor. Each 345kV conductor would have 45/7 aluminum/steel stranding, with an overall conductor diameter of 1.345 inches and a weight of 1.432 pounds per foot and a nonspecular finish.

² Kcmil (1,000 cmils) is a quantity of measure for the size of a conductor; kcmil wire size is the equivalent cross-sectional area in thousands of circular mils. A circular mil (cmil) is the area of a circle with a diameter of one thousandth (0.001) of an inch.

³ Aluminum/steel refers to the conductor material composition. The preceding numbers indicate the number of strands of each material type present in the conductor (i.e., 42/7 aluminum/steel stranding has 42 aluminum strands wound around seven steel strands).

⁴ For transmission lines, a circuit consists of three phases. A phase may consist of one conductor or multiple conductors (i.e., sub-conductors) bundled together.

⁵ Nonspecular finish refers to a “dull” finish rather than a “shiny” finish.

2.2.3 Conductors for Segments 4c

The proposed conductor for the relocated Mona – Huntington 345kV transmission line loop into Clover Substation (Segments 4c) is 954 kcmil 54/7 ACSR “Cardinal.” Each phase of the 345kV three-phase circuit would be composed of two sub-conductors in a double-bundle configuration. The individual 954 kcmil conductors would be bundled in a vertical configuration with spacing of 18 inches. The double-bundle configuration is proposed to provide adequate current carrying capacity and to provide for a reduction in audible noise and radio interference when compared to a single large-diameter conductor. Each 345kV conductor would have 54/7 aluminum/steel stranding, with an overall conductor diameter of 1.196 inches and a weight of 1.229 pounds per foot and a nonspecular finish.

2.3 Other Hardware

2.3.1 Insulators

As shown in Figure 4, insulator assemblies for 345kV H-frame tangent structures would consist of one insulator string hung vertically from the cross arm in the form of an “I.”

As shown in Figures 2, 3, 5, and 6, insulator assemblies for the 345kV mono-pole structures and the 500kV tangent structures would consist of two strings of insulators normally in the form of a “V.” The V-shaped configuration of the insulators restrains the conductor bundle from excessive swing into the structure in high winds allowing a more compact phase separation. Dead-end insulator assemblies for both 345kV and 500kV lines would use an I-shaped configuration, which consists of insulators hung from either a structure dead-end arm or a dead-end pole in the form of an “I.” Insulators would be composed of grey porcelain or green-tinted toughened glass.

2.3.2 Grounding Systems

A grounding system would be installed at the base of each transmission structure that would consist of copper ground rods embedded into the ground in immediate proximity to the structure foundation and connected to the structure by a buried copper lead. When the resistance to ground for each transmission structure would be greater than 15 ohms with the use of ground rods, counterpoise would be installed to lower the resistance to 15 ohms or less. Counterpoise consists of a bare copper-clad or galvanized-steel cable buried a minimum of 12 inches deep, extending from structures (from one or more legs of structure) for approximately 200 feet within the right-of-way. During final design of the transmission line segments, appropriate electrical studies would be conducted to identify the issues associated with paralleling other facilities and the types of equipment that would need to be installed (if any) to mitigate the effects of the induced currents. In extremely rare situations where the soil conditions are nonresistant, the buried copper lead may need to be extended outside of the right-of-way. Coordination with the agencies would occur in these instances.

2.3.3 Minor Additional Hardware

In addition to the conductors, insulators, and overhead shield wires, other associated hardware would be installed on the structure as part of the insulator assembly to support the conductors and shield wires. This hardware would include clamps, shackles, links, plates, and various other pieces composed of galvanized steel and aluminum.

Other hardware that is not associated with the transmission of electricity may be installed as part of the Project. This hardware may include aerial marker spheres or aircraft warning lighting as required for the

conductors or structures per Federal Aviation Administration (FAA) regulations.⁶ Structure proximity to airports and structure height are the determinants of whether FAA regulations would apply based on an assessment of wire/structure strike risk.

2.4 Communications Systems

2.4.1 Optical Ground Wire

Reliable and secure communications for system control and monitoring of Gateway South is very important to maintain the operational integrity of the Project and of the overall interconnected system. Primary communications for relaying and control would be provided via the optical ground wire (OPGW), for the Company's operation of the transmission system, which would be installed on the transmission lines. For the 500kV transmission lines, a secondary communications path would be provided by the Company's existing microwave system, which is currently installed from the Central Wyoming area to existing substations in central Utah. A secondary communications path also may be developed using a power line carrier for the Company's operation of the transmission system. No new microwave sites are anticipated for the Project. Updated microwave equipment may be installed at existing sites and at the substations.

Each structure would have two lightning-protection shield wires installed on the peaks of each of the 500kV single-circuit lattice-steel and H-frame structures (Figures 2 and 3). On the 345-kV H-frame structures, (Figures 4 through 6) these lightning-protection shield wires would be installed at the top of each pole. On both the 500kV and 345kV transmission lines where communication is required, one of the shield wires would be composed of extra-high-strength-steel wire with a diameter of 0.5 inch and a weight of 0.517 pound per foot. The second shield wire would be an OPGW constructed of aluminum and steel, which carries 48 glass fibers within its core. The OPGW would have a diameter of 0.64 inch and a weight of 0.375 pound per foot. The glass fibers inside the OPGW shield wire would provide optical data transfer capability among the Company's facilities along the fiber path for the Company's operation of the transmission system. The data transferred are required for system control and monitoring. On lines where communication is not required, both of the shield wires would be composed of the extra-high-strength steel wires. For Gateway South, all 500kV line segments would be designed to carry an OPGW. For the 345kV lines, Segment 4a would be designed to carry an OPGW.

2.4.2 Regeneration Stations

As the data signal is passed through the optical fiber cable, the signal degrades with distance. Consequently, signal regeneration stations are required to amplify the signals if the distance between substations or regeneration stations exceeds 55 miles. The exact locations cannot be determined at this time and would be based on the selected route.

A regeneration station may be housed within a substation control house in those cases where a substation is located along or near the final transmission route at an appropriate milepost. Otherwise, land must be obtained. Where a new site is required, the typical site would be 100 feet by 100 feet, with a fenced area of 75 feet by 75 feet. A 12-foot- by 32-foot- by 9-foot-tall building or equipment shelter (metal or concrete) would be placed on the site, and access roads to the site and power from the local electric distribution circuits would be required. An emergency generator with a liquid-petroleum-gas-fuel tank

⁶ U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular AC 70/7460-1K Obstruction Marking and Lighting, August 1, 2000; and Advisory Circular AC 70/7460-2K Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace, March 1, 2000.

would be installed, in compliance with current regulations, at the site inside the fenced area. Two diverse communication cable routes (aerial and/or buried) from the transmission right-of-way to the equipment shelter would be required. Figure 7 illustrates the plan arrangement of a typical regeneration station.

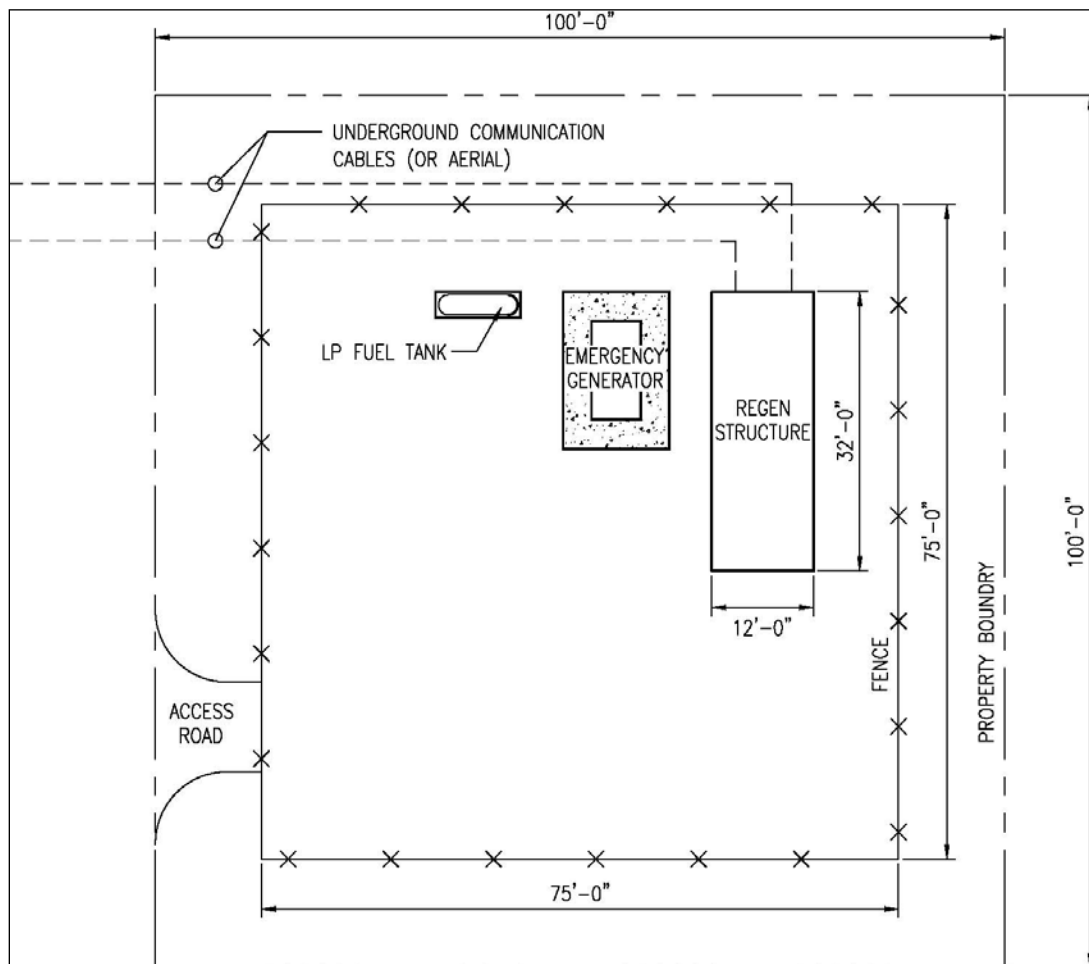


Figure 7 Typical Regeneration Station Site

2.5 Access to the Right of Way

Access to the right-of-way is an essential part of the construction and operation of the Project. Large foundation auger equipment, heavily loaded trucks, cranes, and specialized transmission-line construction equipment would be required for construction, maintenance, and emergency restoration activities. Annual ground-based inspections require vehicular access using four-wheel-drive trucks or four-wheel-drive all-terrain vehicles (ATVs) to each structure site. Section 4 (System Operation and Maintenance) describes in detail operational requirements.

During construction, vehicular access would be required to each structure. New access would be constructed and existing pathways widened as needed. Access not required after construction would be restored to the original condition or left as is, depending on landowner or land-management agency requirements.

Access construction employs heavy equipment including bulldozers, front-end loaders, dump trucks, water trucks, backhoes, excavators (both tracked and rubber-tired), and graders. Other specialized equipment, including boom trucks to install culverts in some areas, would be used where needed. Access would be built to provide a stable, permanent minimum 14-foot-wide travel surface. Depending on the side slope, disturbance width would be larger than 14-feet and can include cuts and fills, crowning and ditching, at-grade water bars, and various kinds of water-body crossings.

The largest of the heavy equipment needed, which dictates the minimum-needed road dimensions, is a truck-mounted aerial-lift crane 100,000 pounds gross-vehicle-weight eight-wheel-drive, 210-foot telescoped boom. Vehicle width is 8feet 6 inches (102 inches) or less and wheelbase is approximately 40 feet. To accommodate this equipment, the road specifications require a minimum 14-foot-wide road top (travel way) with minimum 16- to 22-foot-wide road width in turns. The required access disturbance area and travel way in areas of rolling to hilly terrain would require a wider disturbance to account for cuts and fills, or where vehicles are required to pass one another while traveling in opposite directions.

During routine operations (by four-wheel-drive truck and ATVs), vehicular access would be needed to each structure for periodic inspections and maintenance and to areas of forest or tall shrubs to control vegetation in the right-of-way for safe operation. In an emergency (i.e., in the event of a structure or conductor failure) full emergency access, including cranes and other heavy equipment, would be needed. Based on historical reliability of lattice structures and conductors, it is anticipated that only a small fraction of the structure sites would require emergency access over the life of the Project.

Following are access types anticipated to be used and or developed for the Project. The Company's typical water-body crossings standards are included as Attachment A of this appendix, Rocky Mountain Power's Transmission Construction Standard TA501.

Existing Roads – No Improvement: The Existing Roads – No improvement access-road type includes existing paved or all weather surfaced roads that meet the Company's construction road standards. The Company's construction-road standards include the use of a minimum travel surface width of 14 feet and require a travel-surface width of up to 22 feet depending on the radius of curves.

The Existing Roads - No Improvement access-road type includes existing maintained paved or all-weather surfaced roads that are able to be used in their current condition. The use of the term 'No-Improvement' is intended to signify that no additional new disturbance would be created outside of an established disturbed area. As such, the Existing Roads - No Improvement access-road type could include regular maintenance to make the road passable for construction. Regular maintenance could include, but is not limited to, minor blading activities, repair of washed out areas, wash-boarded areas, depressions requiring graveling, approach installation, and other minor improvements.

Existing Roads – Improvements Required: The Existing Roads - Improvements Required access-road type includes existing roads that require improvements to meet the Company's construction-road standards. The Existing Roads - Improvements Required access-road type includes existing roads that may require widening to a minimum 14 foot travel-surface width to meet the Company's construction-road standards. In areas of steep terrain, the road travel-surface width could be a maximum of 22 feet to meet the Company's construction-road standards, depending on radius of curves and the slope of the terrain. As a result, total disturbance has the potential to exceed 22 feet, depending on the slope of the terrain. Disturbed areas, as a result of cut-and-fill slopes, would exceed the travel-surface width in areas of steep terrain.

Improvements to this access-road type could include, but are not limited to, blading to create a road to meet the Company's construction-road standards, cut-and-fill activities, re-establishing drainage features,

tree removal, boulder and rock removal, bridge and culvert construction, installation of wash crossings, and other improvements to provide an adequate surface to support construction and maintenance vehicles.

Improvements to this access-road type may require reclamation to preconstruction conditions as determined by the land-management agency requirements or landowner requirements.

New Roads - Bladed: The New Roads – Bladed access-road type includes the construction of new permanent access roads where existing roads do not exist with the purpose of allowing for access to the Project right-of-way. New bladed access roads would be constructed to meet the Company’s construction-road standards. The Company’s road-construction standards include constructing a minimum travel-surface width of 14 feet. In areas of steep terrain, the road travel-surface width could be a maximum of 22 feet to meet the Company’s construction-road standards, depending on radius of curves and the slope of the terrain. As a result, total disturbance has the potential to exceed 22 feet, depending on the slope of terrain. Disturbed areas, as a result of cut-and-fill slopes, would exceed the travel-surface width in areas of steep terrain.

New Roads – Overland Travel: The New Roads – Overland Travel access-road type includes new permanent access routes that would use Overland Travel with the purpose of allowing for access to the Project right-of-way. It is intended that Overland Travel access is used in areas where access can be attained without construction of roads according to the Company’s access road standards. As such, overland travel would be used in areas of relatively flat topography. The result would be an access route that eventually would become a two-track trail or naturally revegetate completely, but still allow the Company’s access without grading after construction.

Overland travel comprises the following two different methods:

- **Drive and Crush**, which is vehicular travel to access a site without significantly modifying the terrain. Vegetation is crushed, but not cropped, soil is compacted but no surface soil is removed. Even though vegetation may be damaged or destroyed, this creates vertical mulch on the surface soil and leaves the seed bank in place. Crushed vegetation would likely resprout after temporary use is stopped. A dozer, grader, or other type of equipment may be used to move boulders or other obstructions that prevent overland travel. Additionally, minor areas where the planned access crosses a side slope that exceeds the allowable slope for access by construction or maintenance vehicles, may be graded to provide safe passage. The disturbed area would be blended, to the extent practicable, into the existing grades and revegetated according to the prescribed mitigations.
- **Clear and Cut**, which is considered as above-grade removal of vegetation in order to improve or provide suitable access for equipment. All vegetation is removed using above-grade cutting methods that leave the root crown intact. Soils are compacted, but no surface soil is removed. A dozer, grader, or other type of equipment may be used to move boulders or other obstructions that prevent overland travel. Additionally, minor areas where the planned access crosses a side slope that exceeds the allowable slope for access by construction or maintenance vehicles, may be graded to provide safe passage. The disturbed area would be blended, to the extent practicable, into the existing grades and revegetated according to the prescribed mitigations.

Temporary Roads: The Temporary Roads access-road type is the temporary construction or use of roads to access a site and can include existing trails or two-track roads or overland travel access to support the construction of the Project and access the Project right-of-way. This access-road type may not require construction to meet the Company’s road-construction standards. However, this access road type would be constructed to provide a safe travel way and, as such, temporary disturbance could result. Temporary

disturbance would be dictated by the underlying ground conditions, but disturbance could range from significant, such as blading/cut and fill activities, to minor, such as overland travel.

Unless otherwise noted by the land-management agency or landowner, this access-road type requires reclamation, to the extent practicable, to preconstruction conditions.

2.6 Series Compensation Substations

As mentioned in Section 1.2 of this appendix, two series compensation substations are planned. They are required to improve the transport capacity and efficiency of the transmission line. Locations for the stations have not been identified, as of the date of this Draft EIS; however, they would be located approximately one-third (Series Compensation Station No. 1) and two-thirds (Series Compensation Station No. 2) of the distance from the Aeolus Substation to the Clover Substation. The Company's preference is to site each series compensation station in-line with the transmission line. However, if directly routing the line through the station is precluded because of potential conflict with station site requirements, land use(s), or sensitive environmental resource, the line would diverge from centerline (but remain within a 4-mile-wide area) to provide a connection into and out of the series compensation station.

The following sections describe key components of series compensation substations.

2.6.1 Bay

A substation "bay" is the physical location within a substation fenced area where the high-voltage circuit breakers and associated steel transmission line termination structures, high-voltage switches, bus supports, controls, and other equipment are installed. For the 500kV transmission line, circuit breakers, high-voltage switches, bus supports, and transmission line termination structures typically would be installed. The tallest structures in the substations would be the 500kV dead-end structures, which vary in height from approximately 70 to 135 feet, and/or a microwave antenna tower, which would be 100 feet or more depending on the height needed to maintain line of sight to the nearest microwave relay site. Additional equipment including 500kV transformers and 500kV shunt reactors (which resemble a transformer in appearance), and 500kV shunt-capacitor banks would be installed.

Figure 8 is a perspective sketch illustrating the appearance of a typical 500kV substation with multiple line connections.

2.6.2 Access Road

Permanent all-weather access roads are required at the series compensation substation sites to provide access for personnel, material deliveries, vehicles, trucks, heavy equipment, low-boy tractor trailer rigs (used for moving large transformers), and ongoing maintenance activities at each site. Substation access roads are normally well-compacted, graded gravel roads approximately 20 feet wide with a minimum 110-foot turning radius to accommodate the delivery of large transformers to the site. New access roads would be developed from public roads to the two series compensation substations.

2.6.3 Control Building

One or more control buildings are required at each substation to house protective relays, control devices, battery banks for primary control power, and remote monitoring equipment. The size and construction of the building depends on individual substation requirements. Typically, the control building would be constructed of concrete block, pre-engineered metal sheathed, or composite surfaced materials. Special

control buildings may be developed within the series compensation substation developments to house other control and protection equipment.

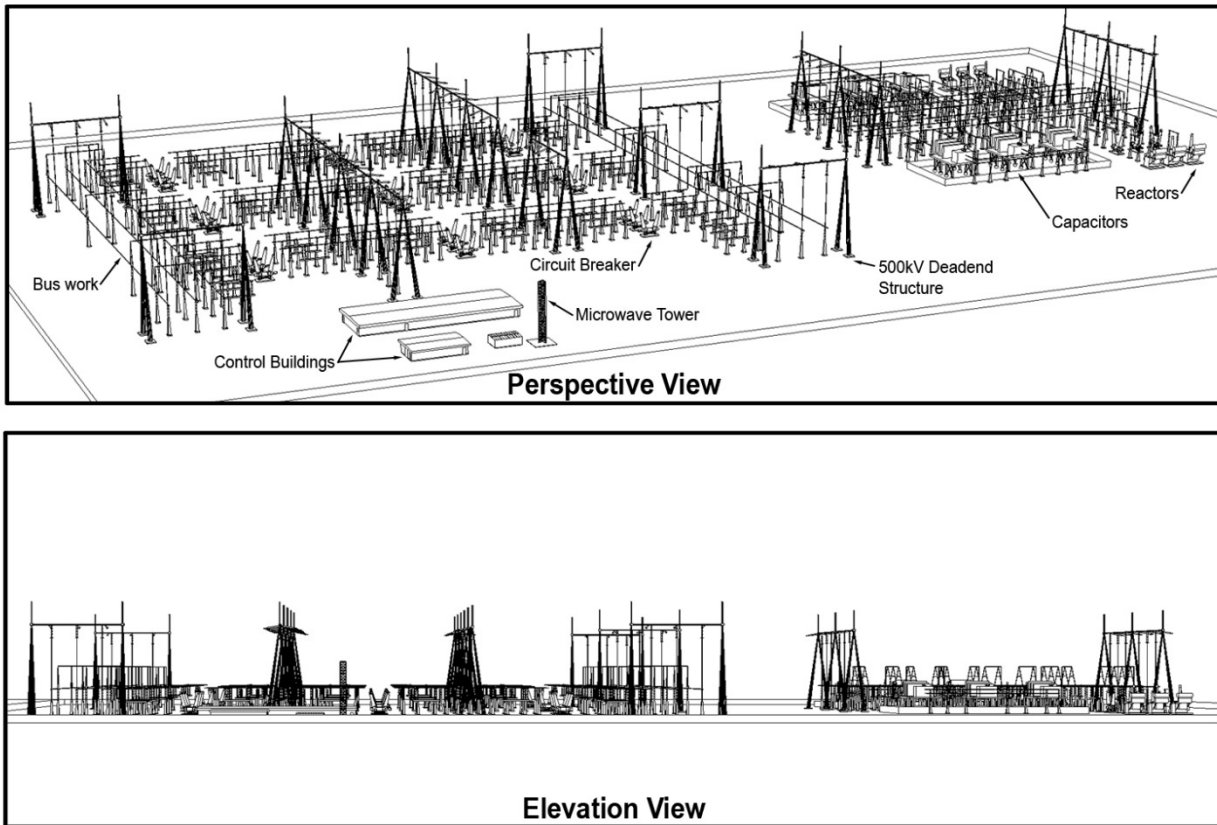


Figure 8 Typical 500-kilovolt Substation

2.6.4 Fencing

Security fencing would be installed around the entire perimeter of each series compensation substation to protect sensitive equipment and prevent accidental contact with energized conductors by third parties. This 7-foot-high fence would be constructed of chain link with steel posts, with 1 foot of barbed wire above the chain link and with locked gates.

2.6.5 Distribution Supply Lines

Station-service power would be required at each substation or regeneration station. Typically, station-service power is provided from a local electric distribution line, located in proximity to the substation or regeneration station. The voltage of the distribution supply line is typically 34.5kV or lower and carried on wood poles. For all new substations sites, it would be necessary to extend the electric distribution line from a suitable take-off point on the existing distribution line to the new Gateway South substation site or regeneration station. The location and routing of the existing distribution lines to the new substation sites would be determined during the final design process. Modifications to the existing distribution facilities may be necessary to provide increased capacity to support the expansions at the existing substation sites.

3 SYSTEM CONSTRUCTION

The following section and subsections describe land requirements and construction activities for the Project, including transmission line, series compensation substations, communication, and associated ancillary features.

All construction would be completed in accordance with the Project Construction Plan of Development (POD), which would be required as a condition of signing any federal land-use authorization (e.g., right-of-way grant, special-use permit, license agreement) and would be incorporated into such land-use authorization. The Construction POD will include such documents as:

- Traffic and Transportation Management Plan
- Stormwater Pollution Prevention Plan Framework
- Spill Prevention, Containment, and Countermeasures Plan Framework
- Historic Property Treatment Plan
- Blasting Plan Framework
- Plant and Wildlife Species Conservation Measures Plan
- Erosion, Dust Control, and Air Quality Plan
- Hazardous Materials Management Plan Framework
- Emergency Preparedness and Response Plan Framework
- Noxious Weed Management Plan
- Fire Protection Plan
- Stream, Wetland, Well, and Spring Protection Plan
- Paleontological Resources Treatment Plan
- Reclamation, Revegetation, and Monitoring Framework Plan

The Construction POD also will include more detailed descriptions of construction activities and requirements.

3.1 Land Requirements and Disturbance

3.1.1 Right-of-Way Width

The Company proposes to acquire a permanent 250-foot-wide right-of-way for the 500kV single-circuit sections of the Project, and a 150-foot-wide right-of-way for the 345kV single-circuit Segment 4c of the Project. Segments 4a and 4b would be in existing right-of-way. The determination of these widths is based on two criteria:

- Sufficient clearance in the span between support structures to obstacles outside the right-of-way must be maintained during a high wind event when the conductors are blown towards the right-of-way edge.

- Sufficient room must be provided within the right-of-way at the support structures to perform transmission line maintenance. See Subsection 4.1 of this document for details of maintenance requirements.

During construction, temporary permission and/or right-of-way would be required from landowners and land-management agencies during construction of temporary components of the Project such as multi-purpose construction yards and helicopter fly yards. During operation, Project land requirements would be restricted to the right-of-way, access roads, series compensation substations, and communication facilities. Access to the right-of-way would be in accordance with the land rights obtained as part of the grant or easement acquisition process. As further details of the final Project design are engineered, the amount of land required may change.

3.1.2 Right-of-Way Acquisition

Rights-of-way for transmission line facilities on private lands would be obtained as perpetual easements. Land for series compensation substations or regeneration stations would be obtained in fee simple where located on private land. Every effort would be made to purchase the land and/or obtain easements on private lands through reasonable negotiations with the landowners. All negotiations with landowners would be conducted in good faith, and the Project's effect on the parcel or any other concerns the landowner may have would be addressed.

In order to achieve the capacity needed to serve present and future loads within the Company's service areas, the North American Electricity Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) reliability standards require minimum separation from existing transmission lines that serve substantially the same load as that served by each of the new Gateway South transmission segments. In these cases, it is the Company's minimum separation guideline that the Gateway South transmission line be located at least one span length from the nearest existing 230kV or higher-voltage transmission lines. Land between rights-of-way that are separated to meet reliability criteria would not be encumbered with an easement, but could be limited in some land uses due to the proximity of two or more large transmission lines.

3.1.3 Land Disturbance

Table 3 includes disturbance dimensions of land from construction and operation activities for the Project.

Table 3 Summary of Land Disturbance Required for Construction and Operation of the 500- and 345-kilovolt Transmission Lines	
Feature	Description
500kV Transmission Line	
Line length	Approximately 400 to 540 miles (depending on route selected)
Span length	Self-supporting steel-lattice 1,000 to 1,500 feet
	H-frame 1,200 to 1,300 feet
Structures per mile	Self-supporting steel-lattice approximately 4 to 5
	H-frame approximately 4
Right-of-way width	250 feet
Land Temporarily Disturbed	
Structure work area	250 by 250 feet per structure
Wire-pulling/tensioning	250 by 400 feet; two every 3 to 5 miles
Splicing sites	100 by 100 feet every 9,000 feet
Guard structures	150 by 75 feet; approximately 1.4 structures per 1 mile

Table 3 Summary of Land Disturbance Required for Construction and Operation of the 500- and 345-kilovolt Transmission Lines	
Feature	Description
Multi-purpose construction yards	30-acre site located approximately every 20 miles on private and/or public land (locations to be determined) ¹
Helicopter fly yards	15-acre site located approximately every 5 miles ²
Access roads (improve existing, spur, and new)	Improve existing, spur, and new roads would be a minimum of 14-foot-wide travel surface (in steeper terrain the travel surface width could be a maximum of 22 feet for radius of curves) plus disturbance for grading and drainage features (total distance to be determined)
Land Permanently Required	
Area occupied by structure (pad)	60 by 60 feet per structure (self-supporting steel-lattice)
Series compensation stations	Two at 160 acres each
Communication regeneration station	100 by 100 feet with 75- by 75-foot fenced areas and a 12- by 32-foot building; one station approximately every 55 miles
Access roads (improve existing, spur, and new)	Improved existing, spur, and new roads would typically have a 14-foot-wide travel surface (in steeper terrain the travel surface width could be a maximum of 22 feet for radius of curves) plus disturbance for grading and drainage features (total distance to be determined)
345kV Transmission Lines	
Line lengths	Three segments totaling approximately 6.6 miles
Span length	H-frame – to 1,200 feet Single- and double-circuit mono-pole – 700 to 800 feet
Structures per mile	H-frame approximately 4 to 7 per mile Single- and double-circuit mono-pole approximately 6 to 8 per mile
Right-of-way width	Segments 4a and 4b on existing right-of-way, Segment 4c 150 feet
Land Temporarily Disturbed	
Structure work area	150 by 200 feet per structure
Wire-pulling/tensioning	150 by 400 feet; one site located at each end of Project
Splicing site	100 by 100 feet; one site for segments 4a and 4b
Guard structures	150 by 75 feet approximately 1.4 structures per 1 mile
Multi-purpose construction yards	10-acre site; one site located near Clover Substation
Helicopter fly yard	15-acre site located near Clover Substation (location to be determined) ²
Access roads (improve existing, spur, and new)	Improve existing, spur, and new roads would be 14 feet wide
Land Permanently Required	
Area occupied by structure (pad)	5 by 40 feet per structure (H-frame)
Access roads (improve existing, spur, and new)	Improve existing, spur, and new roads would be 14 feet wide
NOTES: ¹ Multi-purpose construction yards include concrete batch plants, which would occur approximately every 60 miles except in areas where the Project could be serviced by existing concrete batch plants. Helicopter landing and refueling also would occur in the multi-purpose construction yards. ² Helicopter fly yards, which are used to transport materials to structure work areas during construction, also may include space dedicated for refueling helicopters.	

3.2 Transmission Line Construction

The following sections describe the transmission-line construction activities and procedures for Gateway South. Figure 9 illustrates the transmission line construction sequence. Substation construction is described in Subsection 2.4 of this appendix. Various construction activities would occur during the

construction process, with several construction crews operating simultaneously at different locations on three transmission line segments (spreads).

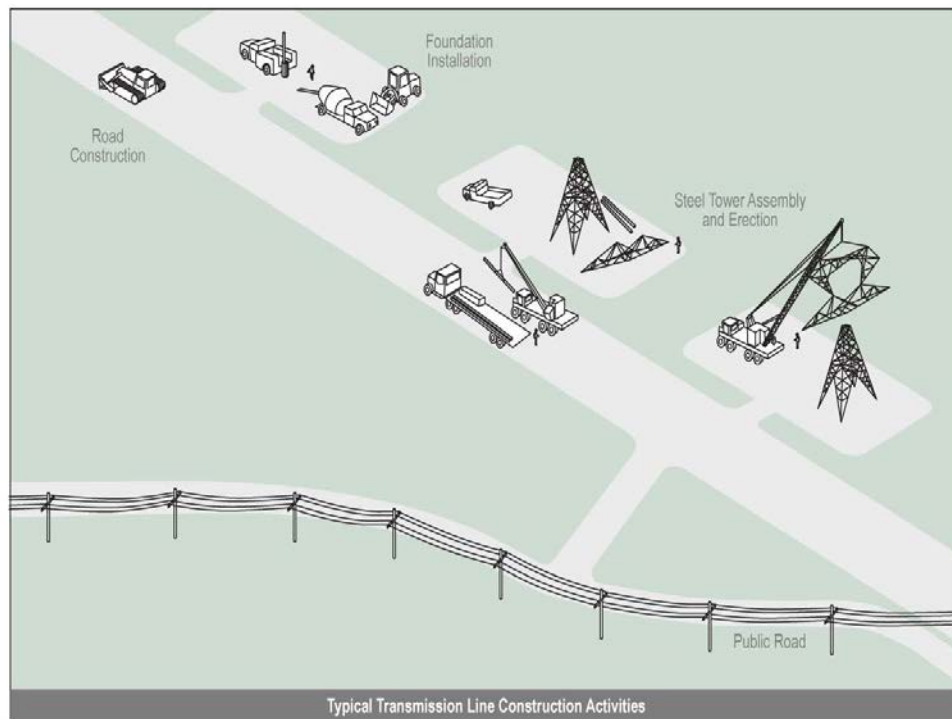


Figure 9 Transmission Line Construction Sequence

Approximately 400 to 540 miles (depending on alternative route selected) of 500kV transmission lines and associated support structures would be constructed, between Aeolus Substation and Clover Substation. Less than 10 miles of three segments (Segments 4a, 4b, and 4c) would be 345kV construction between the Clover and Mona substations.

3.2.1 Transmission Line System Access

Construction of the 500kV and 345kV transmission lines would require vehicle, truck, and crane access to each new structure site for construction crews, materials, and equipment. Similarly, construction of other Project components such as staging yards and substation sites would require vehicle access.

Transmission line right-of-way access would be a combination of new access, improvements to existing access, and use of existing access as is. New access or improvements to existing access would be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders would be used to move the soil locally or off site. Typically, access to the transmission line right-of-way and structure sites requires a 14-foot-wide travel way for straight sections and a 16- to 22-foot-wide travel way at curves to facilitate safe movement of equipment and vehicles. However, in certain areas, access widths through curves may exceed 22 feet. Wherever possible, new access would be constructed within the proposed transmission line right-of-way, or existing access would be used. In other cases, access would be required between the proposed transmission line and existing access. Erosion control and sedimentation measures such as crossroad drainage, at-grade water bars, culverts, sediment basins, or perimeter control would be installed as required to minimize erosion during and subsequent to construction of the Project.

After Project construction, existing and new permanent access would be used by maintenance crews and vehicles for inspection and maintenance activities. New access created to construct structures would be revegetated only. Temporary construction access not required for future maintenance would be restored after completion of Project construction. For example, access to multi-purpose yards (see description below) would not be required once the yard is regraded and vegetated. Gates (or other barriers) would be installed as required to restrict unauthorized vehicular access to the right-of-way. Access retained for operations would be seeded with a seed mix required by the agencies and allowed to revegetate. For normal maintenance activities, an 8-foot-wide portion of access would be used and vehicles would drive over the vegetation. For nonroutine maintenance requiring access by larger vehicles, the full width of the access may be used. Access areas would be repaired, as necessary, but not be routinely graded. Vegetation (e.g., taller shrubs and trees) that may interfere with the safe operation of equipment would be managed on a cyclical basis.

3.2.2 Geotechnical Investigations within the Right-of-way

The purpose of the geotechnical investigation is to perform tests and collect samples to aid in preparation of soil parameters to be used in the final design of structure foundations. This activity is necessary help ensure the system is designed and constructed to be safe, reliable, cost efficient, and can reduce the overall temporary and permanent land disturbance within the right-of-way during initial build and the life of the Project.

The geotechnical investigations would consist of the drilling and sampling of soils to a typical depth of 50 to 60 feet below the existing ground. The borehole depth may exceed 60 feet if soil conditions indicate. The boreholes would have a diameter of approximately 8 inches and typically would be backfilled with auger cuttings and on-site soils. Access roads and overland access routes as designed for the final right-of-way grant would be used exclusively.

Helicopter and/or manually transported drill rigs may be used for geotechnical exploration in areas where existing roads do not provide adequate access or where overland travel is prohibited. Geophysical exploration techniques would be employed to assist in subsurface characterization. Geophysical techniques cannot replace drilling. One form of geophysical testing, refraction microtremor (ReMi) uses instrumentation combined with surface actuation to identify subsurface soil and rock stratification. The actuation can be low impact, such as a person jumping up and down. However, a larger actuation, such as that produced by a hammer striking a steel plate lying on the ground, provides more detail in the testing.

The geotechnical investigation would be conducted at both substation/series compensation locations and along the transmission line right-of-way. A description of activities is provided below broken down by facility and type of drilling to accomplish the geotechnical investigation.

The geotechnical exploration program for the transmission line planned according to the Company's standard TA 071. Explorations are specified at all planned angle points and dead-ends, intervals not to exceed 3 miles in long tangent sections of the line, and any additional locations needed to address areas of concern identified in the Geotechnical Desktop Report. The geotechnical exploration for this Project is anticipated to consist of site examinations, access to the bore site by a drill rig and support vehicles, geotechnical drilling, down-hole geotechnical testing, select geophysical surveys, and laboratory testing. In general, drilling depths are anticipated to be 50 to 60 feet. If competent bedrock is encountered, coring would be advanced 5 to 15 feet into competent rock. Access to the boreholes would be made along routes selected and analyzed in the Project EIS. All disturbance associated with the geotechnical exploration program is to be contained completely within the area analyzed for disturbance associated with the transmission line construction.

GEOTECHNICAL DRILLING ACTIVITIES

Anticipated drilling methods to accomplish the exploration depths described above include the following.

Hollow Stem Auger Drilling

Auger drilling consists of rotating a hollow drill stem to advance a toothed bit into the subsurface materials. The materials are brought up from the borehole by the rotation of a continuous helical fin on the outside of the drill stem. The drill stem is added in pieces (flights) as the boring advances downward. This is a dry method of drilling that typically requires no water, drilling mud, or pressurized air as a circulating fluid. The support equipment for auger drilling includes a water truck, either truck or track mounted, and the geologist/engineer's vehicle.

Mud Rotary Drilling

Mud rotary drilling consists of rotating a smooth-walled hollow drill stem and advancing a variety of drill bits at the end of the drill stem. The materials are brought up from the borehole by pumped water, typically travelling down through the drill stem, out the bit, and flowing up the outside of the drill stem. The drilling mud and/or water pumped through the rods carries drill cuttings to the ground surface. A tub at the surface collects the drill cuttings and holds the water for recirculation. The equipment for mud rotary drilling includes the drill rig, a support vehicle for rods and equipment, a water truck, and the geologist/engineer's vehicle.

Air Rotary Drilling

The air rotary drilling method is similar in principle to mud rotary drilling. However, this method uses compressed air as the circulating medium rather than water or mud slurry. Drill cuttings are retrieved from under a hood placed over the borehole or a cyclone. A special type of air rotary drilling involves the use of an air hammer. Compressed air is pumped through the drill pipe to an air hammer bit in the borehole. The pneumatic bit strikes the rock very rapidly. The equipment for air rotary drilling includes the drill, a support vehicle with drilling steel towing an air compressor, and the geologist/engineer's vehicle.

Sonic Drilling

Sonic drilling uses a rotating drill string as with other drilling methods; however, this method uses a sonic drill head to impart a high-frequency vibration on the drill stem and open pipe casing/core barrel that is advanced into the subsurface materials. As the casing is advanced, soil and rock samples are forced up into the casing, providing a continuous sample of the subsurface soil and rock. The frequency of vibration can be changed to match the subsurface conditions, making this type of drilling generally faster than the other drilling methods. Sonic drills are normally mounted on larger transport vehicles. The support equipment for sonic drilling included a vehicle to carry the drill, a support vehicle for rods, and the geologist/engineer's vehicle.

Under-Reamer Type Drilling (ODEX System)

The under-reamer drilling method uses tooling in which an outer drill casing is advanced along with the drill bit (more or less simultaneously, depending on the manufacturer). The drill bit has a section that moves outward through eccentric action when the drill rods are rotated, thereby making the borehole larger than the casing. The larger-diameter hole allows the casing to follow along behind the bit by being hammered or pushed as the hole is drilled. The bit is typically a tungsten carbide button bit that is driven by a percussion air hammer during rotation. A common name for this type of drilling is ODEX, which is an acronym for overburden drilling with eccentric bit. Drill cuttings are removed by compressed air travelling down the drill rod to the bit and returning via the annulus between the drill rod and casing lifting the cuttings to the surface. The air path can be reversed similar to the method used by reverse circulation drilling. The support equipment for under-reaming drilling includes an air compressor, a support vehicle to carry casing, and the geologist/ engineer's vehicle.

Cone Penetration Test Drilling

The cone penetration test (CPT) is a testing method used to determine the engineering properties of soils and delineate soil lithology. The test method consists of pushing an instrumented cone at a constant rate. The instruments measure tip (cone) resistance and friction resistance along the sides. The CPT delineates soil layers from the ratio of cone to side friction resistance. CPT drilling provides excellent geotechnical information in softer formations but typically reaches refusal in soils with gravel, medium dense sands or hard fine grained soils. The CPT drill typically is mounted in a box truck or on a track/all-terrain rig. The support equipment for CPT drilling includes a support truck for equipment, and the geologist/engineer's vehicle.

Drilling Rig Types

The drilling equipment described above is commonly mounted on road-legal two-wheel-drive and four-wheel-drive trucks, tracked vehicles, an oversized-tire ATV, or on platform rigs. Platform rigs can be transported in pieces to the site via helicopter. Additionally, a man-portable drill rig may be used where access is not available. This rig type is transported, in pieces, as closely as possible to the borehole site using road-legal vehicles or off-highway vehicles. The pieces are packed into the site by personnel or livestock and assembled on site to perform the drilling. The type of drilling rig used is dependent on the access difficulties to the borehole location and the sampling methods required. Other vehicles and equipment normally mobilized to each boring location may include a water truck and/or support vehicle, large air compressor, geologist's pickup truck or utility vehicle, and possibly another support truck. In some areas, earthwork equipment may be required to assist with access to the boring location. Tracked support vehicles including the water truck may be required. The drilling subcontractor must be equipped to provide drilling vehicles as demanded by access requirements and the terrain.

3.2.3 Multi-purpose Yards

Construction of Gateway South would begin with the establishment of multi-purpose yards along the Project alignment. The multi-purpose yards would serve as field offices; reporting locations for workers; parking space for vehicles and equipment; and sites for material storage, fabrication assembly, concrete batch plants, and stations for equipment maintenance. The yards, about 30 acres each for 500kV transmission-line construction and one 10-acre site in the Clover Substation area for 345kV transmission-line construction, would be located near each end of each segment of the transmission-line right-of-way, and approximately every 20 miles along the route. Additionally, helicopter fly yards for helicopter operations would be located approximately every 5 miles along the route where helicopter construction is

planned, and would occupy approximately 15 acres each. Lighting would be the minimum required to meet safety and security standards.

Multi-purpose yards and helicopter fly yards may be fenced, have locked gates and may have security guards stationed where needed. Yard locations would be finalized following discussion with the land-management agency or negotiations with landowners. In some areas, the multi-purpose yards may need to be scraped by a bulldozer and a temporary layer of rock laid to provide an all-weather surface. Unless otherwise directed by the land-management agency or landowner, the rock would be removed from the yards upon completion of construction and the area would be restored.

Typically, helicopter fly yards would be located in relatively flat areas with easy, existing access to minimize site grading and new road construction. When possible, these areas would be located in previously disturbed sites or in areas of minimal vegetative cover.

3.2.4 Site Preparation

Individual structure work areas would be cleared to install the transmission-line support structures and facilitate access for future transmission line and structure maintenance. Clearing of individual structure work areas would be required to install the structures. Clearing individual structure sites would be done using a bulldozer to blade the required area, and to the extent practical, blading of native plant communities would be minimized. At each single-circuit 500kV structure location, an area approximately 250 feet by 250 feet would be needed for construction laydown, structure assembly, and erection at each structure site, depending on slope. An area approximately 150 feet by 200 feet would be required for 345kV structure locations. This area would provide a safe working space for placing equipment, vehicles, and materials. For all structure types, the structure work area would be cleared of vegetation only to the extent necessary and any removal of topsoil would be stockpiled and stabilized to limit erosion. After construction, all areas not needed for normal transmission line maintenance, including fire and personnel safety clearance areas, would be graded to blend as near as possible with the natural contours, topsoil replaced, then revegetated as required.

Additional equipment may be required if solid rock is encountered at a structure location. Rock-hauling, hammering, or blasting may be required to remove the rock. Excess rock that is too large in size or volume to be spread at the individual structure sites would be hauled away and disposed of at approved locations or at a location specified by the landowner.

3.2.5 Install Structure Foundations

Each 345kV H-frame typically would require the poles be directly embedded in the ground. Holes would be drilled in the ground using a truck- or track-mounted auger. When the pole is placed in the hole, native or select backfill would be used to fill the voids around the perimeter of the hole. When backfill must be imported, material would be obtained from commercial sources or from areas free of noxious weed species. Similarly, where solid rock is encountered, blasting may be required.

Each 345kV mono-pole support structure and 500kV steel H-frame structure would require the installation of foundations, which typically are drilled concrete piers. The holes would be drilled using truck- or track-mounted augers of various sizes depending on the diameter and depth requirements of the hole to be drilled. Each foundation would extend approximately 2 feet above the ground level.

Where solid rock is encountered, blasting, rock hauling, or the use of a rock anchoring or micro-pile system may be required. Micro-piles are high capacity, small diameter (5-inch to 12-inch) drilled and grouted in-place piles designed with steel reinforcement to primarily resist structural loading. The rock

anchoring or micro-pile system would be used in areas where site access is limited or adjacent structures could be damaged as a result of blasting or rock-hauling activities.

In environmentally sensitive areas with very soft soils, additional equipment such as a HydroVac, which uses water pressure and a vacuum, may be used to excavate material into a storage tank. Alternatively, a temporary casing may be used during drilling to hold the excavation open, after which the casing is withdrawn as the concrete is placed in the hole. In areas where it is not possible to operate large drilling equipment due to access or environmental constraints, hand digging may be required.

Reinforced steel anchor-bolt cages would be installed after excavation and prior to structure installation. These cages are designed to strengthen the structural integrity of the foundations and would be assembled at the nearest multi-purpose yard and delivered to the structure site via flatbed truck or helicopter. These cages would be inserted in the holes prior to pouring concrete. The excavated holes containing the reinforcing anchor bolt cages would be filled with concrete.

LATTICE STEEL STRUCTURE FOUNDATIONS

Each 500kV support structure would require the installation of foundations, which typically are drilled concrete piers. First, four holes would be excavated for each structure. The holes would be drilled using truck- or track-mounted augers of various sizes depending on the diameter and depth requirements of the hole to be drilled. Each foundation would extend approximately 2 feet above the ground level.

Where solid rock is encountered, blasting, rock hauling, or the use of a rock anchoring or micro-pile system may be required. Micro-piles are high capacity, small diameter (5-inch to 12-inch) drilled and grouted in-place piles designed with steel reinforcement to primarily resist structural loading. The rock anchoring or micro-pile system would be used in areas where site access is limited or adjacent structures could be damaged as a result of blasting or rock-hauling activities.

In environmentally sensitive areas with very soft soils, additional equipment such as a HydroVac, which uses water pressure and a vacuum, may be used to excavate material into a storage tank. Alternatively, a temporary casing may be used during drilling to hold the excavation open, after which the casing is withdrawn as the concrete is placed in the hole. In areas where it is not possible to operate large drilling equipment due to access or environmental constraints, hand digging may be required.

Reinforced-steel anchor bolt cages would be installed after excavation and prior to structure installation. These cages are designed to strengthen the structural integrity of the foundations and would be assembled at the nearest Yard and delivered to the structure site via flatbed truck or helicopter. These cages would be inserted in the holes prior to placing concrete. The excavated holes containing the reinforcing anchor bolt cages would be filled with concrete.

Typically, and because of the remote location of much of the transmission line route, concrete would be provided from portable batch plants set up approximately every 60 miles along the line route in one of the multi-purpose yards. Concrete would be delivered directly to the site in concrete trucks with a capacity of up to 10 cubic yards. In the more developed areas along the route and in proximity to the substations, the construction contractor may use local concrete providers to deliver concrete to the site when economically feasible.

3.2.6 Erect Support Structures

The 500-kV lattice-steel and H-frame structures would be assembled on site, except where helicopter delivery is employed. Steel members for each structure would be delivered to the site by flatbed truck. Assembly would be facilitated on site by a truck-mounted crane. Subsequent to assembly, the structures

would be lifted onto foundations using a large crane designed for erecting structures. The crane would move along the right-of-way from structure site to structure site erecting the structures.

The 345kV H-frame, single-circuit and double-circuit mono-pole structures would be framed on site. Two methods of assembly can be used to accomplish this, the first of which is to assemble the poles, braces, cross arms, hardware, and insulators on the ground. A crane is then used to set the fully framed structure by placing the poles in the excavated holes. Alternatively, aerial framing can be used by setting the poles in the ground first and assembling the braces, cross arms, hardware, and insulators in the air. A crane would move along the right-of-way from structure site to structure site setting the structures.

3.2.7 String Conductors, Shield Wire, and Fiber Optic Ground Wire

Conductor, shield wire, and OPGW would be placed on the transmission-line support structures by a process called stringing. The first step to wire stringing would be to install insulators (if not already installed on the structures during ground assembly) and stringing sheaves. Stringing sheaves are rollers that are attached temporarily to the lower portion of the insulators at each transmission line support structure to allow conductors to be pulled along the line. Figure 10 illustrates the sequence of steps in installing conductors.

Additionally, temporary clearance structures (also called guard structures) would be erected where required prior to stringing any transmission lines. The temporary clearance structures typically are vertical wood poles with cross arms and are erected at road crossings or crossings with other energized electric and communication lines to prevent contact during stringing activities. Bucket trucks also may be used to provide temporary clearance. Bucket trucks are trucks fitted with a hinged arm ending in an enclosed platform called a bucket, which can be raised to let the worker in the bucket service portions of the transmission structure as well as the insulators and conductors without climbing the structure.

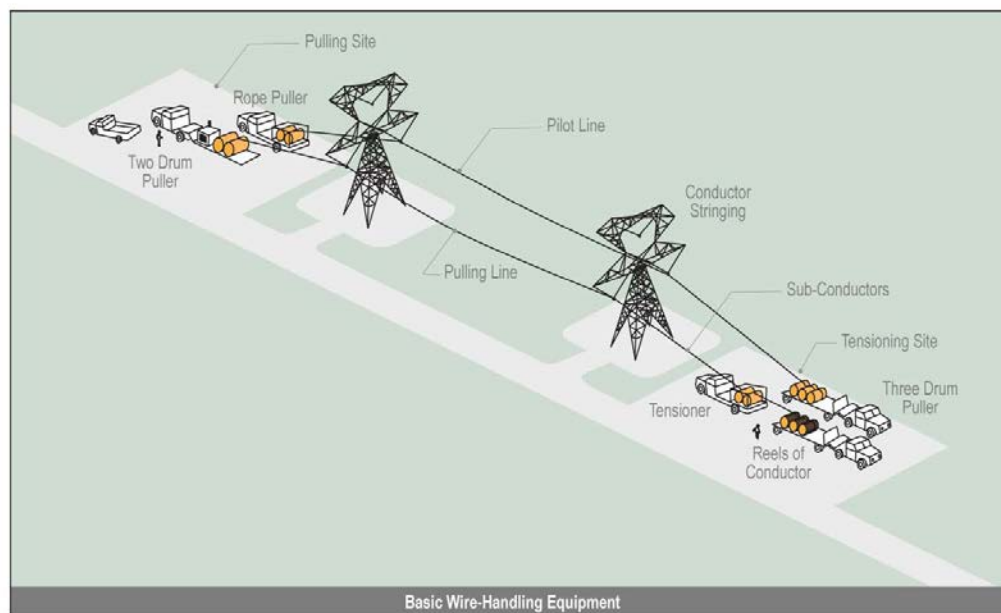


Figure 10 Conductor Installation

Once the stringing sheaves and temporary clearance structures are in place, the initial stringing operation would commence with the pulling of a lighter weight sock line through the sheaves along the same path the transmission line would follow. Typically, the sock line is pulled in via helicopter. The sock line is

attached to the hard line, which follows the sock line as it is pulled through the sheaves. The hard line would be attached to the conductor, shield wire, or OPGW to pull them through the sheaves into their final location. Pulling the lines may be accomplished by attaching them to a specialized wire stringing vehicle. Following the initial stringing operation, pulling and tensioning the line would be required to achieve the correct sagging of the transmission lines between support structures.

Line splicing sites for 500kV construction would be required approximately every conductor length on a standard size reel (approximately 9,000 feet) along the right-of-way and would measure approximately 100 by 100 feet with two wire pulling-and-tensioning sites occurring approximately every 3 to 5 miles measuring 250 by 400 feet each to accommodate required equipment. A pulling-and-tensioning site would be needed for each of the for 345kV segments requiring approximately 150 by 400 feet each to accommodate required equipment. Equipment at sites required for pulling-and-tensioning activities would include cranes, tractors, and trailers with spooled reels that hold the conductors and trucks and trailers with the pulling-and-tensioning equipment mounted. To the extent practicable, pulling and tensioning sites would be located within the right-of-way. Depending on topography, grading may be required at some sites to create level pads for equipment. Finally, the tension and sag of conductors and wires would be fine-tuned, stringing sheaves would be removed, and the conductors would be attached permanently to the insulators at the support structures.

At the tangent and small angle structures, the conductors would be attached to the insulators using clamps to “suspend” the conductors from the bottom of the insulators. At the larger angle dead-end structures, the conductors cannot be pulled through and so are cut and attached to the insulator assemblies at the structure “dead ending” the conductors. There are two primary methods to attach the conductor to the insulator assembly at the dead-end structure. The first method, hydraulic compression fittings, uses a large press and pump that closes a metal clamp or sleeve onto the conductor. This method requires heavy equipment and is time consuming. The second method, implosive fittings, uses explosives to compress the metal together. Implosive fittings do not require heavy equipment, but do create noise similar to a loud explosion when the primer is struck. The implosive type sleeve is faster to install and results in a secure connection between the conductor and the sleeve. Both implosive and conventional compression sleeves are planned for the Project.

The 500kV single-circuit lines use a three conductor bundle for each phase. At each single-circuit 500kV dead-end structure, nine compression or implosive dead-end bodies along with nine compression or implosive terminal connectors to connect the jumpers (three per phase, one for each of the three subconductors on each of the three phases) on each side of the structure would be required, for a total of 18 dead-end bodies and terminal connectors for each single-circuit dead-end structure. The 345kV single-circuit lines use a two-conductor bundle for each phase. Each 345kV dead-end structure would require 12 compression or implosive dead-end bodies along with 12 compression or implosive terminal connectors to connect the jumpers.

3.2.8 Site Reclamation

Multi-purpose yards, helicopter fly yards, and any other locations used for the purpose of the Project, as well as access roads would be kept in an orderly condition throughout the construction period. Approved enclosed refuse containers would be used throughout the Project. Refuse and trash would be removed from the sites and disposed of in an approved manner. Oils or chemicals would be hauled to a disposal facility authorized to accept such materials. Open burning of construction trash would not be allowed.

Disturbed areas not required for access roads and maintenance areas around structures would be restored and revegetated, as required by the landowner or land-management agency as soon as possible to limit the spread and establishment of noxious weed species. Multi-purpose yards, helicopter fly yards, structure

work areas, wire pulling-and-tensioning sites, wire-splicing sites, guard structures, and temporary roads would be decompacted and the topsoil replaced unless otherwise specified by the landowner or land-management agency. The landowner, land-management agency, or local Natural Resources Conservation Service would be consulted regarding the appropriate seed mix and rate to revegetate the areas. Temporary culverts would be removed. Drivable at-grade waterbars would be installed where needed with frequency proportional to road slope to prevent erosion of the roadbed. All practical means would be made to restore the land outside the minimum areas needed for safe operation to its original contour and to restore natural drainage patterns along the right-of-way.

The seed mix used for any restoration and revegetation project would be determined in consultation with the landowner or land-management agency. All seed and plant material used on federal land would be approved by the federal land-management agency. All seed would meet all of the requirements of the Federal Seed Act and applicable Wyoming, Colorado, and Utah laws regarding seeds and noxious weeds. Only seed certified as “noxious weed free” would be used. If requested, the Company or its contractor would provide the landowner with evidence of seed certification. Any seed mixture would not contain aggressive, non-native species that might invade the site. Where necessary, the surface of the ground would be prepared prior to seeding. Where practical, the Company would follow these guidelines for preparing the seedbed:

1. The road surface would be cleared of foreign materials, such as garbage, paper, and other materials, but all rocks, limbs, or minor woody debris would be left in place. The Company or its contractor would prepare the seedbed immediately prior to seeding.
2. Under favorable soil-moisture conditions, a standard disk or spring bar harrow would be used (where ripping is not required) to roughen the topsoil layer to create the desired surface texture before the seed is applied. Dirt clods and chiseled voids resulting from the roughening process increase the surface area for water collection and provide micro-sites for seed establishment. The soil should be disked or harrowed to no more than 2 inches deep at a time when soil moisture allows the surface to remain rough, with clods approximately 2 to 4 inches in diameter.
3. Ripping, disking, or harrowing would be performed parallel to surface contours. In this way, downslope alignment of furrows can be avoided. In areas that already have the desired soil characteristics; the seedbed does not need to be prepared.

After the seedbed has been prepared, the Company or its contractor would broadcast the seed on the disturbed area, after which the seed would be lightly harrowed into the roadbed or raked into the ground. Mulch and fertilizers would be added if necessary. An area would not be seeded when wind velocities prohibit the seed mix from being applied evenly. If the seed does not germinate and establish to an agreed-upon level of vegetation cover (e.g., consistent with adjacent site conditions) after two growing seasons, the Company or its contractor would reseed during a period acceptable to the landowner. On National Forest System land, the Company would be responsible for monitoring the effectiveness of soil protection and restoration measures and would take corrective measures as needed to ensure long-term soil protection.

Other seeding methods, such as drilling, hydroseeding, or aerial application, may be used depending on the area that requires reclamation and site conditions.

3.3 Communications System

OPGW for the communications system would be installed at the same time as the conductors on each of the transmission line structures. It would be tensioned in the same way.

3.3.1 Regeneration Stations

Similar to the substations, the selected area is graded, vegetation is removed, and a layer of crushed rock is installed. Typically, a 12-foot by 32-foot by 9-foot-tall building or equipment shelter (metal or concrete) would be constructed on the site. An emergency generator with a liquid-petroleum-gas-fuel tank would be installed, in accordance with current regulations, at the site inside the fenced area. Two diverse communication cable routes (aerial and/or buried) from the transmission right-of-way to the equipment shelter would be installed.

3.3.2 Access Road

Regeneration station roads would be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders would be used to move the soil locally or off site. Either gravel or asphalt would be applied to the prepared base layer. The all-weather road surface would be graveled and would have crossroad drainage where applicable.

3.4 Substation/Series Compensation Substation Construction

As mentioned in Section 1.2 of this appendix, construction activities at the Aeolus, Clover, and Mona substations, including expansions and areas needed for equipment installation for Gateway South will be or have been completed as components of other projects of the Energy Gateway program. The two series compensation substations would be constructed as part of the Gateway South Project. A description of typical substation construction follows.

A typical construction sequence for substations and series compensation sites is described below. All equipment and materials would be hauled to the site via truck.

The first activity is grading of the site and access road. The amount of equipment and manpower would vary depending on the size of the site and the terrain. However, large earth moving equipment would be used including dump trucks, water trucks, graders, back hoes and dozers. Dump trucks would be used to haul away unsuitable materials and to bring in fill materials if necessary and access road surfacing.

The earth moving equipment would be used to grade the site relatively flat with a small slope for drainage, and depending on site design, drainage features and/or retention ponds. The water trucks would be used to control dust from site work activities.

The perimeter fence would then be constructed to provide site security and control access.

Foundations would then be installed. There are typically two types of foundations: drilled piers and slabs. Foundations are excavated using a large drill rig or backhoe depending on the type of foundation. Reinforcing steel and/or anchor bolts are placed in the excavation and forms are placed to form the sides of the top portion of the foundation. The entire excavation is then filled with concrete. The spoils from the excavations are hauled from the site and disposed of, or spread on the site if the material is suitable. On a large site, multiple crews would be used.

The control building would be constructed at the same time as the foundation construction. The building would be constructed of masonry block or would be pre-engineered steel construction depending on design.

The remaining below-grade construction is then completed, including grounding conductors and ground rods, conduit, and concrete cable trench. Excavations are made with trenchers and backhoes, the conductor or conduit is placed in the excavation, connections are made, and then backfilled. In some cases, bedding material, such as sand, is placed in the excavation prior to back filling.

Equipment and steel structures are set on the completed foundations and connected. Equipment includes circuit breakers; disconnect switches, transformers, reactors, capacitors, series capacitors, surge arresters, and instrument transformers. Rigid tubular bus is used for the main conductors, with flexible cable connections to the equipment. All high-voltage conductors are supported on insulators. Construction equipment includes cranes and man lifts. On a large site, multiple crews would be used.

Control and protection panels would be installed in the control building and would be connected to equipment in the yard using control and power cables installed in the cable trenches and conduits.

The final step is to cover the entire site with a crushed rock surfacing. Dump trucks would be used to haul the material to the site. Back hoes, skid steers, dozers and graders would be used to spread and compact the material over the site.

All equipment, protection and control systems would be tested prior to energizing.

3.4.1 Substation Roads

Substation roads would be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders would be used to move the soil locally or off-site. Either gravel or asphalt would be applied to the prepared base layer and would have crossroad drainage where applicable.

3.4.2 Geotechnical Drilling

Although the expansions and areas needed for Gateway South equipment installation were analyzed as part of other Energy Gateway program projects, geotechnical evaluation is required at both substation sites, as well as the two series compensation substation sites, to quantify subsurface conditions, determine engineering properties of soil for foundation design and provide recommendations for site development.

The substation geotechnical exploration program would consist of drilling approximately 25 to 30 borings at each substation and each series compensation station. Borings would be advanced to an approximate depth of 50 feet (depending on the depth of anticipated cuts, fills, and structure foundations) using hollow-stem auger, air-rotary, and/or ODEX drilling methods. If competent bedrock is encountered, coring would be advanced 5 to 15 feet into competent rock. Refraction microtremor and field resistivity testing would be completed at each of the two substation sites and the two series compensation station sites. Field resistivity measurements would be conducted in general accordance with the Wenner 4-pin method.

3.4.3 Clearing and Grading

Clearing of all vegetation would be required for the entire series compensation substation area, including a distance of about 10 feet outside the fence. This is required for personnel safety due to grounding concerns and because of lower clearances to energized conductors within the substations as compared to transmission lines. These lower clearances are allowed by the NESC because the entire substation is fenced.

An insulating layer of gravel on the surface of the substation is required to protect personnel from high currents and voltages during electrical fault conditions. Typically, vegetation is removed and a 4- to 6-inch layer of crushed rock is applied to the finished surface of the substation. Then the substation is usually treated with a soil sterilizer to prevent vegetation growth because the vegetation would degrade the insulating qualities of the crushed rock. The entire substation area would be graded essentially flat, with just enough slope to provide for runoff of precipitation. The substation would be graded to use existing drainage patterns to the extent possible. In some cases, drainage structures, such as ditches, culverts, and sumps, may be required. Clearing and grading material would be disposed of in compliance with local ordinances. Material from off site would be obtained at existing borrow or commercial sites and would be trucked to the substation using existing roads and the substation access road.

3.4.4 Multi-purpose Yards

Multi-purpose yards may be located outside the substation fenced area near the substation site. These yards may be part of the substation property or leased by the contractor. After construction is completed, all debris and unused materials would be removed and the yards returned to preconstruction conditions by the construction contractor.

3.4.5 Grounding

A grounding system is required in each substation for detection of faults and for personnel safety. The grounding system typically consists of buried copper conductor arranged in a grid system and driven ground rods, typically 8 to 10 feet long. The ground rods and any equipment and structures are connected to the grounding conductor grid. The amount of conductor and length and number of ground rods required are calculated based on fault current and soil characteristics.

3.4.6 Fencing

Security fencing is installed around the entire perimeter of each new or expanded substation to protect sensitive equipment and prevent accidental contact with energized conductors by third parties. This 7-foot-high fence would be constructed of chain link with steel posts. One foot of barbed wire or other similar material is installed on top of the chain link yielding a total fence height of 8 feet. Locked gates would be installed at appropriate locations for authorized vehicle and personnel access.

3.4.7 Foundation Installation

Foundations for supporting structures are of two types: spread footings or drilled piers. Spread footings are placed by excavating the foundation area, placing forms and reinforced-steel and anchor bolts, and pouring concrete into the forms. After the foundation has been poured, the forms would be removed, and the surface of the foundation dressed. Pier foundations are placed in a hole generally made by a truck-mounted auger. Reinforced-steel and anchor bolts are placed into the hole using a truck-mounted crane. The portion of the foundation above ground would be formed. The portion below ground uses the undisturbed earth of the augered hole as the form. After the foundation has been poured, the forms would be removed, the excavation would be backfilled, and the surface of the foundation dressed.

Equipment foundations for circuit breakers and transformers would be slab-on-grade type. These foundations are placed by excavating the foundation area; placing forms, reinforced steel, and anchor bolts (if required); and placing concrete into the forms. After the foundations have been poured, the forms would be removed, and the surface of the foundation dressed. Where necessary, provision would be made in the design of the foundations to mitigate potential problems due to frost. Reinforced steel and anchor bolts would be transported to each site by truck, either as a prefabricated cage or loose pieces, which

would be fabricated into cages on the site. Concrete would be hauled to the site in concrete trucks. Excavated material would be spread at the site or disposed of in accordance with local ordinances. Structures and equipment would be attached to the foundations by means of threaded anchor bolts embedded in the concrete. Some equipment such as transformers and reactors may not require anchor bolts.

3.4.8 Oil Containment

Some types of electrical equipment, such as transformers and some types of reactors and circuit breakers, are filled with an insulating mineral oil. Containment structures are required to prevent equipment oil from getting into the ground or water bodies in the event of a rupture or leak. These structures take many forms depending on site requirements, environmental conditions, and regulatory restrictions. The simplest type of oil containment is a pit, of a calculated capacity, under the oil-filled equipment that has an oil-impervious liner. The pit is filled with rock to grade level. In case of an oil leak or rupture, the oil captured in the containment pit is pumped into tanks or barrels and transported to a disposal facility. If required, more elaborate oil containment systems can be installed. This may take the form of an on- or off-site storage tank and/or oil-water separator equipment depending on site requirements.

3.4.9 Structure, Control Building, and Equipment Installation

Supporting steel structures are erected on concrete foundations as noted above. These are set with a truck-mounted crane and attached to the foundation anchor bolts by means of a steel base plate. These structures would be used to support the energized conductors and certain types of equipment. This equipment is lifted onto the structure by means of a truck-mounted crane and bolted to the structures; electrical connections are then made. Some equipment, such as transformers, reactors, and circuit breakers, are mounted directly to the foundations without supporting structures. These are set in place by means of a truck-mounted crane. Some of this equipment requires assembly and testing on the pad. Electrical connections to the equipment are then made.

3.4.10 Control Building Construction

One or more control buildings are required at each substation to house protective relays, control devices, battery banks for primary control power, and remote monitoring equipment. The size and construction of the building depends on individual substation requirements. Typically, the control building would be constructed of concrete block, pre-engineered metal sheathed, or composite surface materials. Once the control house is erected, equipment is mounted and wired inside. All stand-alone regeneration stations and substations (with the exception of the Aeolus Substation) would require an emergency propane or diesel generator just outside the control house within the substation fenced area.

3.4.11 Conductor Installation

The two main types of high-voltage conductors used in substations are tubular aluminum for rigid bus sections and/or stranded-aluminum conductor for strain bus and connections to equipment. Rigid bus would be a minimum of 4 inches in diameter for this Project and would be supported on porcelain or polymer insulators on steel supports. The bus sections would be welded together and attached to special fittings for connection to equipment. Stranded-aluminum conductors would be used as flexible connectors between the rigid bus and the station equipment.

3.4.12 Conduit and Control Cable Installation

Most substation equipment requires low-voltage connections to protect relaying and control circuits. These circuits allow metering, protective functions, and control (both remote and local) of the power system. Connections are made from the control building to the equipment through multi-conductor control cables installed in conduits and/or pre-cast concrete cable trench system.

3.4.13 Construction Cleanup

The cleanup operation would be performed after construction activities are completed. All waste and scrap material would be removed from the site and deposited in approved locations or local permitted landfills in accordance with local ordinances. Ruts and holes outside the substation fence due to construction activities would be regraded.

3.4.14 Reclamation

Revegetation and restoration would be conducted as required and desired vegetation established to limit the spread and establishment of noxious weed species in disturbed areas.

3.5 Special Construction Techniques

3.5.1 Blasting

Typical 500kV steel-lattice structure foundations and the 345kV mono-pole structure foundations normally would be installed using drilled shafts or piers and 345kV H-frame structures would be embedded directly. If hard rock is encountered within the planned drilling depth, blasting may be required to loosen or fracture the rock in order to reach the required depth to install the structure foundations. Precise locations where blasting is expected would be identified based on a site-specific geotechnical study carried out as part of detailed design. A blasting plan would be developed and approved by the agencies as part of the Construction POD.

3.5.2 Helicopter Use

Helicopters may be used to construct in rough terrain where access is difficult or where access through environmentally sensitive areas cannot be avoided. A small helicopter may be used to move personnel and to install pulling lines (called “sock-lines”) in order to facilitate installing conductor. Larger, heavy-lift helicopters could be used to ferry construction equipment, concrete, or structures to a specific site.

Project construction activities potentially facilitated by helicopters may include delivery of construction laborers, equipment, and materials to structure sites; structure placement; hardware installation; and wire-stringing operations. Helicopters also may be used to support the administration and management of the Project by the construction contractor or Company.

Helicopters would set down in areas identified to receive temporary disturbance. The operating area of the helicopters would be limited to helicopter fly yards and multi-purpose yards and positions along the utility corridors that previously have been identified for this purpose, and are safe locations for landing. When a portion of the transmission line requires construction using helicopter support, the multi-purpose yards would serve as a helicopter support yard for fueling, maintenance, and transporting both material and personnel to and from the structure site locations.

Final siting requirements of all helicopter fly yards and support yards and site requirements would be conducted with the input of the helicopter contractor, and affected private landowners and land-management agencies, such as the Bureau of Land Management (BLM) and U.S. Forest Service (USFS). The size of each helicopter fly yard and support yard would be dependent on the size and number of structures to be installed within safe flying range.

The area required for these fly yards can range in size and depends on road access and topography. The yards should be as level as possible, and be located strategically throughout the area of helicopter-supported construction activity. In some instances, because of the presence of vegetation and/or an uneven surface, the area required for a specific yard may need to be brushed, grubbed, and/or graded, including removal of trees in some instances. Ideally they should be located at a higher elevation than the structure sites they would support, as it is safer and more fuel efficient to fly down toward the structure site with heavy loads than it is to fly up to the structure site. Additionally, the fly yards must be accessible by road to facilitate the delivery of structure steel, rebar, concrete, construction tools, equipment, and other materials used in the construction of the structures.

The following are activities that may take place at helicopter fly yards:

- Structure steel, bolts, fittings, and blocking would be hauled and stored for use.
- Structure sections would be preassembled using a rough terrain crane.
- Rebar for assembling cages and/or preassembled rebar cages for structure foundations would be delivered, then flown out of this yard to each structure site.
- Concrete would be staged by truck delivery or batch plant, which would generate the required concrete to be loaded into a concrete transport bucket that would be attached to a helicopter and flown out to the structure sites.
- Refueling the helicopter and necessary light maintenance; a fuel truck and a mechanics truck would be located at these yards.
- Transporting personnel, tools, and small equipment by helicopter to and from the yards and the construction sites.
- Temporary parking for a fuel truck, a mechanics truck, and transport vehicles for personnel.
- Yards may serve as a safe landing area for the helicopter in case of an emergency.

The specific types of helicopters used would be based upon the Project need, the weight of the load being transported, and the altitude of the structure location. The various needs would range from light loads (crew/inspector transportation, and conductor stringing) to medium-to-heavy loads (tool and material delivery/removal, and structure removal/construction activities). The specific helicopters used also would vary, depending on availability and Project schedule.

Construction workers and equipment would be dropped off at pulling-and-tensioning sites, structure locations, or other work areas to receive temporary disturbance.

Large heavy-lift helicopters would be used to transport a structure to a location where the ground crew is waiting to spot the structure onto a preconstructed foundation. The helicopter would fly from predetermined yards and transport the preassembled structure sections to each structure site. Depending on the size and weight of the load, several round trips may be required from the helicopter fly yard to fully construct each structure. Each fly yard can support several structure sites and must be located no farther away from the structure-site locations than is within the safe round-trip-flight distance limitation

of the helicopter(s) being used. The typical safe round trip flight distance for a heavy-lift helicopter is a 2- to 3-mile radius, depending upon altitude and load.

During helicopter operations, public access to defined areas would be restricted. Temporary road closures, traffic detours, and posted notices and signs would be used to restrict public access to construction areas. This would be in addition to general public access restrictions to protect public health and safety.

3.5.3 Water Use

Construction of the transmission lines and series compensation substations would require water. Major water uses are for transmission line structure and station foundations, and dust control during right-of-way and substation grading and site work. A minor use of water during construction would include the establishment of substation landscaping where required. Table 4 (based on the Company's preferred route) lists the approximate amount of water required for the Project.

Table 4 Estimated Water Usage	
Transmission Line Spread	Total Million Gallons
Spread 1	59
Spread 2	27
Spread 3	21
Total Transmission Line Water Usage	107
Series Compensation Substations	Total Million Gallons
Series Compensation Substation 1	7
Series Compensation Substation 2	10
Total Series Compensation Substations	17
Total Million Gallons Water Required	124

Water would be used for two primary purposes: foundation construction and right-of-way and access-road dust control. The required water would be procured from municipal sources, from commercial sources, or under a temporary water-use agreement with landowners holding existing water rights. No new water rights would be required. In the construction of foundations, water is transported to the batch-plant site where it would be used to produce concrete. From the batch plant, the wet concrete would be transported to the structure site in concrete trucks for use in foundation installation.

Construction of the transmission lines and related facilities would generate a temporary increase in fugitive dust. If the level of fugitive dust is too high in specific Project areas, as determined in cooperation with the landowner or land-management agency, water would be applied to disturbed areas to minimize dust.

Water usage for substation construction is primarily for dust control during site preparation work. During this period, construction equipment would be cutting, moving, and compacting the subgrade surface. As a result, water trucks patrolling the site to control dust would make as many as one pass per hour over the station site. Once site preparation work is complete, concrete for the placement of foundations becomes the largest user of water and dust control becomes minimal.

Once site grading is complete, the balance of the substation construction work would be performed on bare subgrade soil or subgrade with a thin layer of rock. Fire risk would be minimal due to the bare ground or rock surface, and would be contained within the confines of station fenced area.

3.6 Construction Elements

3.6.1 Construction Workforce

The proposed Project would be constructed primarily by contract personnel, with the Company responsible for Project administration and inspection. The construction workforce for the transmission line would consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel who would perform the construction tasks see Table 5 for work force estimates.

Site grading requires a small number of people including a surveyor, heavy equipment operators, foreman, and construction-management personnel. Each series compensation station would require numerous concrete crews in order to complete the below grade construction and concrete placement on schedule. Concrete most likely would be provided by a batch plant producing approximately 160 cubic yards per day delivered in 8-cubic-yard trucks. Other below-grade crews would be needed to install conduit, cable trench, and ground mat material. The below-grade crews would be on site overlapping the schedule of the concrete crew. Several three-man crews working with boom trucks and bucket trucks would erect the steel and install the physical equipment in the yard (Table 6 – Manpower and Equipment for Series Compensation Stations). Electrical installation would be handled by several two-man teams alternating between indoor and outdoor activity. Construction generally would occur between 7 a.m. and 7 p.m., Monday through Saturday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities.

3.6.2 Construction Equipment and Traffic

Equipment required for construction of Gateway South would include, but would not be limited to, that listed in Table 7 – Typical Equipment and Duration of Use. This table includes the equipment type and the anticipated daily duration of use for each equipment type.

Estimated Personnel and Equipment for 500kV Transmission Line Construction access would occur at several locations along the transmission line route, resulting in dispersed construction traffic. Truck deliveries normally would be on weekdays between 7:00 a.m. and 5:00 p.m.

3.6.3 Construction Equipment and Traffic

Equipment required for construction of Gateway South would include, but would not be limited to, that listed in Table 7 – Typical Equipment and Duration of Use. This table includes the equipment type and the anticipated daily duration of use for each equipment type.

Estimated Personnel and Equipment for 500kV Transmission Line Construction access would occur at several locations along the transmission line route, resulting in dispersed construction traffic. Truck deliveries normally would be on weekdays between 7:00 a.m. and 5:00 p.m.

The equipment required for transmission line construction is similar for both the 500kV and 345kV lines. The highest level of traffic would be when the wire-stringing operations begin while several other operations are occurring at the same time, which would likely include excavating holes, installing foundations, hauling steel, assembling structures, and erecting structures.

Table 5
Work Force Estimation – Duration and Totals for Construction of a 500-kilovolt Transmission Line

Work Item	Estimated Duration (Weeks)			Number of Crews			Number of Workers per Crew			Total Number of Workers		
	Spread 1	Spread 2	Spread 3	Spread 1	Spread 2	Spread 3	Spread 1	Spread 2	Spread 3	Spread 1	Spread 2	Spread 3
Construction management/ supervision – contractor	121	91	107	1	1	1	10	10	10	10	10	10
Construction maintenance and repairs	121	91	107	1	1	1	8	8	8	8	8	8
Construction management – owner	121	91	107	1	1	1	5	5	5	5	5	5
Inspection	121	91	107	1	1	1	12	12	12	12	12	12
Contractor mobilization	16	16	16	3	3	3	3	3	3	9	9	9
Receive and handle materials	114	82	98	2	2	2	4	4	4	8	8	8
Survey/stake access roads and structure pads	85	47	44	2	2	2	3	3	3	6	6	6
Construct access roads and structure pads	85	47	44	1	1	2	9	9	9	9	9	18
Survey/stake new structure locations	85	47	44	1	1	1	3	3	3	3	3	3
Tree removal/clearing	0	21	32	0	2	2	0	9	9	0	18	18
Excavate structure holes	84	42	33	2	2	2	2	2	2	4	4	4
Tie and haul rebar	84	42	33	1	1	1	5	5	5	5	5	5
Set forms and pour concrete	84	42	33	1	1	1	13	13	13	13	13	13
Batch plant(s) and concrete trucks	84	42	33	1	1	1	13	13	13	13	13	13
Haul steel and materials	84	42	33	1	1	1	3	3	3	3	3	3
Haul blocking and shake-out steel	84	42	33	1	1	1	4	4	4	4	4	4
Assemble structures – tangent	84	42	33	6	6	6	9	9	9	54	54	54
Assemble structures – dead-end	84	42	33	2	2	2	12	12	12	24	24	24
Bottom setting crews (legs and body ext.)	84	42	33	1	1	1	8	8	8	8	8	8
Structure torquing crew	84	42	33	1	1	1	5	5	5	5	5	5
Erect structures	72	37	28	2	2	2	10	10	10	20	20	20
Backbolt and torque after erection	72	37	28	2	2	2	3	3	3	6	6	6
Load, haul, and spot overhead optical ground wires, overhead optical ground wire, and conductors	68	35	33	1	1	1	5	5	5	5	5	5

Table 5 Work Force Estimation – Duration and Totals for Construction of a 500-kilovolt Transmission Line												
Work Item	Estimated Duration (Weeks)			Number of Crews			Number of Workers per Crew			Total Number of Workers		
	Spread 1	Spread 2	Spread 3	Spread 1	Spread 2	Spread 3	Spread 1	Spread 2	Spread 3	Spread 1	Spread 2	Spread 3
Install and remove guard structures	68	35	33	1	1	1	5	5	5	5	5	5
Install overhead optical ground wire, overhead optical ground wire, and conductors	68	35	33	1	1	1	12	12	12	12	12	12
Sage, dead-end, clip, dampers, spacers	68	35	33	6	6	6	6	6	6	36	36	36
Final clean up (gig sheet)	63	33	33	1	1	1	4	4	4	4	4	4
Reclamation/restoration	63	33	33	2	2	2	4	4	4	8	8	8
Total per spread										299	317	326
Total workers										942		
NOTES: Spread 1 of the Company’s preferred route, approximately 228 miles consisting of Links W15, W21, W35, W36, W30, W32, W101, W125, W108, W116, W113, W410, W411, C31, C61, C91, C175, C186, C188 Spread 2 of the Company’s preferred route, approximately 103 miles consisting of Links U242, U280, U285, U300, U400, U401, U404, U406 Spread 3 of the Company’s preferred route, approximately 76 miles consisting of Links U525, U435, U545, U546, U548, U600, U636, U637, U639, U650, U640												

Table 6 Equipment and Manpower Needed for Series Compensation Stations	
Equipment	Quantity
Site Development (90 acres)	
Scraper – Cat 631	4
Dozer – Cat D9 (pushing and ripping)	1
Dozer – Cat D8 (fill Cat)	1
Grader – Cat 16G	2
Roller Compactor – Cat 583	2
Excavator – Cat 330 (slopes and ditching)	1
Water truck	2
Water storage	1
Water self-loader tower	1
Pump (4-inch)	1
Water tanker	2
GPS laser	1
All-terrain vehicle grader	1
Mechanic truck	1
Fuel truck	1
Pickup – 3/4-ton extended cab	2
Pickup – 1-ton crew cab	6
Office trailer	1
Port-a-potty	4
Dumpster	2
Manpower	35 to 40 days
Foundations	
Drill – Texoma 600 (for bus supports – typical)	1
Drill – Watson 3100 (for towers – typical)	1
Boom truck – 33-ton, National 14110	1
Boom truck – 17-ton, JLG1700JBT	1
Excavator – Cat 315	1
Roller compactor – Bomag BW124	1
Plate compactor – Wacker WP1550	2
Rubber-tire backhoe – Cat 326	1
End dump	1
Water truck	1
Mechanic truck	1
Fuel truck	1
GPS laser	1
All-terrain vehicle for grader	1
Pickup – ¾-ton extended cab	2
Pickup – 1-ton crew cab	2
All-terrain vehicle (golf cart look alike)	3
Office trailer	1
Port-a-potty	4
Dumpster	3
Manpower	30 to 40 days

Table 6 Equipment and Manpower Needed for Series Compensation Stations	
Equipment	Quantity
Steel Structures	
Crane – Grove RT600E	1
Boom truck – 33-ton, National 14110	2
Boom truck – 17-ton, JLG1700JBT	1
Manlift	2
Manpower	12 to 40 days
Equipment Install, Insulators and Bus	
Boom truck – 33-ton, National 14110	2
Boom truck – 17-ton, JLG1700JBT	2
Manlift	4
Welder truck	4
Tools and materials – Conex	2
Manpower	20 to 40 days
Control Wiring	
Boom truck – 17-ton, JLG1700JBT	2
Manlift	4
Small puller	3
Reel stand on trailer	2
Flatbed truck – 10-ton	1
Van – ¾-ton	4
Tools and materials – Conex	2
Fiber splicer van	1
Office trailer	1
Port-a-potty	3
Dumpster	3
Manpower	20 to 40 days

Table 7 Typical Equipment and Duration of Use for Construction of a 500-kilovolt Transmission Line												
Equipment	Spread 1				Spread 2				Spread 3			
	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)
Project Management/Inspection												
Truck – pickup	15	6	6	121	15	6	6	91	15	6	6	107
Project Supervision – Contractor												
Truck – pickup	10	8	6	121	10	8	6	91	10	8	6	107
Mainline Maintenance – Contractor												
Truck – pickup	1	6	6	121	1	6	6	91	1	6	6	107
Truck – flatbed (1-ton)	2	6	6	121	2	6	6	91	2	6	6	107
Truck – mechanics (2-ton)	5	8	6	121	5	8	6	91	5	8	6	107
Survey												
Truck – pickup	1	4	6	85	1	4	6	47	1	4	6	44
Truck – flatbed (1-ton)	1	4	6	85	1	4	6	47	1	4	6	44
Multi-purpose Yards												
Truck – pickup	1	4	6	114	1	4	6	92	1	4	6	98
Truck – flatbed (1-ton)	1	2	6	114	1	2	6	92	1	2	6	98
Truck – flatbed (2-ton)	1	2	6	114	1	2	6	92	1	2	6	98
Forklift (5-ton)	1	8	6	114	1	8	6	92	1	8	6	98
Forklift (10-ton)	1	8	6	114	1	8	6	92	1	8	6	98
Crane RT (20-ton)	1	2	6	114	1	2	6	92	1	2	6	98
Trailer – office	1	10	6	114	1	10	6	92	1	10	6	98
Generator – portable (office)	1	10	6	114	1	10	6	92	1	10	6	98
Tree Clearing												
Truck – pickup	Not applicable				2	8	6	21	2	8	6	32
Truck – flatbed (1-ton)					2	4	6	21	2	4	6	32
Truck – flatbed (2-ton)					1	4	6	21	1	4	6	32
Truck – semi-trailer					4	8	6	21	4	8	6	32
Trailer – timber haul, with pup					4	8	6	21	4	8	6	32
Loader – with grapple					2	6	6	21	2	6	6	32
Loader – bucket					2	6	6	21	2	6	6	32
Slasher					2	6	6	21	2	6	6	32
Chain saws					6	8	6	21	6	8	6	32
Road Building												
Truck – pickup	1	2	6	85	1	2	6	47	2	2	6	44
Truck – flatbed (1-ton)	1	2	6	85	1	2	6	47	2	2	6	44
Truck – flatbed (2-ton)	1	4	6	85	1	4	6	47	2	4	6	44
Truck – water	1	6	6	85	1	6	6	47	1	6	6	44

Table 7 Typical Equipment and Duration of Use for Construction of a 500-kilovolt Transmission Line												
Equipment	Spread 1				Spread 2				Spread 3			
	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)
Truck – fuel	1	4	6	85	1	4	6	47	1	4	6	44
Truck – dump (10Y)	2	6	6	85	2	6	6	47	4	6	6	44
Truck – semi-trailer	2	6	6	85	2	6	6	47	4	6	6	44
Trailer – lowboy	2	6	6	85	2	6	6	47	4	6	6	44
Backhoe – with bucket	1	6	6	85	1	6	6	47	2	6	6	44
Loader – with bucket	2	6	6	85	2	6	6	47	4	6	6	44
Loader – with brusher/grubber	2	8	6	85	2	8	6	47	2	8	6	44
Grader – road	1	8	6	85	1	8	6	47	2	8	6	44
Dozer – with blade	2	8	6	85	2	8	6	47	4	8	6	44
Dozer – with ripper	1	8	6	85	1	8	6	47	1	8	6	44
Foundations												
Truck – pickup	3	8	6	84	3	8	6	42	3	8	6	33
Truck – flatbed (1-ton)	6	4	6	84	6	4	6	42	6	4	6	33
Truck – flatbed (2-ton)	2	5	6	84	2	5	6	42	2	5	6	33
Truck – water	1	6	6	84	1	6	6	42	1	6	6	33
Truck – fuel	1	4	6	84	1	4	6	42	1	4	6	33
Truck – dump (10Y)	2	6	6	84	2	6	6	42	2	6	6	33
Truck – semi-trailer	2	8	6	84	2	8	6	42	2	8	6	33
Trailer – lowboy	1	6	6	84	1	6	6	42	1	6	6	33
Trailer – flatbed	2	6	6	84	2	6	6	42	2	6	6	33
Truck – flatbed with boom (5-ton)	1	6	6	84	1	6	6	42	1	6	6	33
Truck – concrete	4	6	6	84	4	6	6	42	4	6	6	33
Drill rig – digger	2	8	6	84	2	8	6	42	2	8	6	33
Drill rig – pneumatic wagon	1	6	6	84	1	6	6	42	1	6	6	33
Backhoe – with bucket	1	4	6	84	1	4	6	42	1	4	6	33
Dozer – with blade	1	4	6	84	1	4	6	42	1	4	6	33
Loader – with bucket	1	4	6	84	1	4	6	42	1	4	6	33
Crane RT (20-ton)	1	4	6	84	1	4	6	42	1	4	6	33
Forklift (5-ton)	1	4	6	84	1	4	6	42	1	4	6	33
Loader – bobcat	1	4	6	84	1	4	6	42	1	4	6	33
Generator – portable (5 horsepower)	2	4	6	84	2	4	6	42	2	4	6	33
Trailer – office	1	10	6	84	1	10	6	42	1	10	6	33
Generator – portable (office)	1	10	6	84	1	10	6	42	1	10	6	33

Table 7 Typical Equipment and Duration of Use for Construction of a 500-kilovolt Transmission Line												
Equipment	Spread 1				Spread 2				Spread 3			
	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)
Material Hauling												
Truck – flatbed (1-ton)	1	4	6	114	1	4	6	42	1	4	6	33
Truck – flatbed (2-ton)	1	4	6	114	1	4	6	42	1	4	6	33
Truck – semi-trailer	1	8	6	114	1	8	6	42	1	8	6	33
Truck – flatbed with boom (5-ton)	1	4	6	114	1	4	6	42	1	4	6	33
Trailer – flatbed	6	8	6	114	6	8	6	42	6	8	6	33
Forklift (10-ton)	1	4	6	114	1	4	6	42	1	4	6	33
Steel Assembly												
Truck – pickup	4	8	6	84	4	8	6	42	4	8	6	33
Truck – flatbed (1-ton)	20	4	6	84	20	4	6	42	20	4	6	33
Truck – flatbed (2-ton)	3	8	6	84	3	8	6	42	3	8	6	33
Truck – water	1	6	6	84	1	6	6	42	1	6	6	33
Crane RT (20-ton)	6	4	6	84	6	4	6	42	6	4	6	33
Compressor – pneumatic	6	6	6	84	6	6	6	42	6	6	6	33
Generator – portable (5 horsepower)	2	2	6	84	2	2	6	42	2	2	6	33
Trailer – office	1	10	6	84	1	10	6	42	1	10	6	33
Generator – portable (office)	1	10	6	84	1	10	6	42	1	10	6	33
Steel Erection – Conventional¹												
Truck – pickup	3	8	6	72	3	8	6	37	3	8	6	28
Truck – flatbed (1-ton)	6	4	6	72	6	4	6	37	6	4	6	28
Truck – flatbed (2-ton)	2	4	6	72	2	4	6	37	2	4	6	28
Crane RT (20-ton)	2	6	6	72	2	6	6	37	2	6	6	28
Crane RT (75-ton)	2	6	6	72	2	6	6	37	2	6	6	28
Crane (150- to 250-ton)	2	6	6	72	2	6	6	37	2	6	6	28
Dozer – with blade	2	6	6	72	2	6	6	37	2	6	6	28
Compressor - pneumatic	2	4	6	72	2	4	6	37	2	4	6	28
Steel Erection – Helicopter²												
Truck – pickup	3	8	6	24	3	8	6	12	3	8	6	12
Truck – flatbed (1-ton)	6	4	6	24	6	4	6	12	6	4	6	12
Truck – flatbed (2-ton)	2	4	6	24	2	4	6	12	2	4	6	12
Crane RT (20-ton)	1	6	6	24	1	6	6	12	1	6	6	12
Crane RT (75-ton)	1	6	6	24	1	6	6	12	1	6	6	12
Crane (150- to 250-ton)	1	6	6	24	1	6	6	12	1	6	6	12

Table 7 Typical Equipment and Duration of Use for Construction of a 500-kilovolt Transmission Line												
Equipment	Spread 1				Spread 2				Spread 3			
	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)
Dozer – with blade	2	6	6	24	2	6	6	12	2	6	6	12
Compressor - pneumatic	2	4	6	24	2	4	6	12	2	4	6	12
Truck – pickup	2	8	6	12	2	8	6	6	2	8	6	6
Truck – flatbed (1-ton)	2	4	6	12	2	4	6	6	2	4	6	6
Truck – mechanics (2-ton)	1	4	6	12	1	4	6	6	1	4	6	6
Truck – fuel	1	2	6	12	1	2	6	6	1	2	6	6
Helicopter – skylift (large)	1	8	6	12	1	8	6	6	1	8	6	6
Wire Installation												
Truck – pickup	6	8	6	68	6	8	6	35	6	8	6	33
Truck – flatbed (1-ton)	10	6	6	68	10	6	6	35	10	6	6	33
Truck – flatbed (2-ton)	2	8	6	68	2	8	6	35	2	8	6	33
Truck – water	1	6	6	68	1	6	6	35	1	6	6	33
Truck – flatbed with boom (5-ton)	6	8	6	68	6	8	6	35	6	8	6	33
Truck – splicing	1	4	6	68	1	4	6	35	1	4	6	33
Truck – semi-trailer	3	8	6	68	3	8	6	35	3	8	6	33
Trailer – flatbed	4	4	6	68	4	4	6	35	4	4	6	33
Trailer – lowboy	3	4	6	68	3	4	6	35	3	4	6	33
Trailer – reel stand	12	4	6	68	12	4	6	35	12	4	6	33
Crane RT (35-ton)	3	2	6	68	3	2	6	35	3	2	6	33
Puller – triple drum	1	2	6	68	1	2	6	35	1	2	6	33
Puller – single drum	1	2	6	68	1	2	6	35	1	2	6	33
Puller – sockline	2	2	6	68	2	2	6	35	2	2	6	33
Tensioner – conductor	1	2	6	68	1	2	6	35	1	2	6	33
Tensioner – shield wire	1	2	6	68	1	2	6	35	1	2	6	33
Dozer – sagging	2	2	6	68	2	2	6	35	2	2	6	33
Dozer – with blade	2	2	6	68	2	2	6	35	2	2	6	33
Backhoe – with bucket	1	2	6	68	1	2	6	35	1	2	6	33
Drill rig – digger	1	2	6	68	1	2	6	35	1	2	6	33
Compressor – pneumatic	1	2	6	68	1	2	6	35	1	2	6	33
Generator – portable (5 horsepower)	2	2	6	68	2	2	6	35	2	2	6	33
Helicopter – pilot line (small)	1	8	6	68	1	8	6	35	1	8	6	33

Table 7 Typical Equipment and Duration of Use for Construction of a 500-kilovolt Transmission Line												
Equipment	Spread 1				Spread 2				Spread 3			
	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)
Restoration												
Truck – pickup	3	6	6	63	3	6	6	33	3	6	6	33
Truck – flatbed (1-ton)	3	6	6	63	3	6	6	33	3	6	6	33
Truck – flatbed (2-ton)	1	4	6	63	1	4	6	33	1	4	6	33
Truck – water	1	6	6	63	1	6	6	33	1	6	6	33
Truck – dump (10Y)	1	6	6	63	1	6	6	33	1	6	6	33
Truck – semi-trailer	1	6	6	63	1	6	6	33	1	6	6	33
Trailer – lowboy	1	6	6	63	1	6	6	33	1	6	6	33
Backhoe – with bucket	1	4	6	63	1	4	6	33	1	4	6	33
Loader – with bucket	1	4	6	63	1	4	6	33	1	4	6	33
Grader – road	1	8	6	63	1	8	6	33	1	8	6	33
Dozer – with blade	1	8	6	63	1	8	6	33	1	8	6	33
Tractor – 4-wheel drive with chisel and/or seeder	1	8	6	63	1	8	6	33	1	8	6	33
NOTES: ¹ Steel erection – conventional: use this set of equipment values if structure erection is considered to be by conventional ground based methods. ² Steel erection – helicopter: use this set of equipment values if structure erection is considered to include heavy-lift helicopter methods. Spread 1 of the Company’s preferred route, approximately 228 miles consisting of Links W15, W21, W35, W36, W30, W32, W101, W125, W108, W116, W113, W410, W411, C31, C61, C91, C175, C186, C188 Spread 2 of the Company’s preferred route, approximately 103 miles consisting of Links U242, U280, U285, U300, U400, U401, U404, U406 Spread 3 of the Company’s preferred route, approximately 76 miles consisting of Links U525, U435, U545, U546, U548, U600, U636, U637, U639, U650, U640												

For the substation work, the highest level of traffic would be during site grading and foundation installation. It is estimated that 2,000 to 4,000 cubic yards of topsoil would not be suitable for re-use on each site and would have to be disposed of off-site at a remote location. Dump trucks would be leaving and returning to the site constantly each day for the duration of the site grading. Each site would require between 4,000 and 7,000 cubic yards of concrete. Delivering, placing, and finishing concrete is labor intensive. Once concrete placement is complete, traffic on the surrounding roads would subside. Workers would arrive in the morning and leave at the end of the day. The balance of daily traffic would be material deliveries from storerooms, which would probably be one or two trips per day. Each substation would require the delivery of permitted loads such as transformers and/or reactors. Each reactor or transformer bank required would require four large multiple-wheel lowboy trucks. Delivery would be scheduled to match the completion of their respective foundations.

3.6.4 Removal of Facilities and Waste Disposal

Substation and right-of-way construction would generate a variety of solid wastes including concrete, hardware, and wood debris. The solid wastes generated during construction would be recycled or hauled away for disposal at a suitable facility based on their properties. Excavation along the right-of-way and at substations would generate solid wastes that could potentially be used as fill; however, surplus excavated material would be removed for disposal. Excavated material that is clean and dry would be spread along the right-of-way.

The majority of surplus excavated materials associated with substation construction results from spoils created during site grading. Very little of the soil excavated during foundation installation is waste product. Above-grade waste may consist of packing material such as crates, pallets, and paper wrapping to protect equipment during shipping. It is assumed a 12-yard dumpster would be filled once a week with waste material for the duration of each substation project.

3.6.5 Construction Schedule

The Company intends to continue to refine the design of the Gateway South during the agency approval process in order to commence construction immediately when the Project is approved. Final engineering surveys would determine the exact locations of structures, access roads, and other features prior to the start of construction and would be included in the Construction POD. Due to the broad scope of construction, the varied nature of construction activities, and the geographic diversity of the Project area, the Company intends to hire multiple contractors to complete Project work within the projected timeframe and in accordance with industry performance standards. Construction would likely involve multiple construction contracts over a probable 3 to 4-year period ending in December 2020. Multiple spreads would be under construction at the same time. The Company developed a Project construction schedule based on this strategy (Table 8 – Project Duration Schedule). The most construction activity (access disturbance, structure construction, substation expansion, series compensation station development and line stringing) would occur in the first 2 years.

Although the construction rate of progress would be reduced in the winter, it is anticipated that construction would continue through the winter months in the lower-elevation areas of the Project, except during winter storms. In the higher-elevation areas of the Project, winter storms and snow would limit access to the right-of-way. In these areas, it is expected that construction would be suspended on some portions of the right-of-way during the peak winter months and construction resources would either be demobilized or shifted to other segments of the Project.

Transmission-line construction commences with contractor mobilization. The contractor would mobilize equipment and personnel to the construction site at various stages in the Project schedule depending on operational requirements. This would cumulatively require approximately 6 weeks throughout the

schedule for Segments 1, 2, and 3. Construction management, engineering support, inspection, materials handling, and administration are required throughout the Project. First, surveyors would start at one end of the segment and stake the locations of access roads. Road construction can start 1 to 2 weeks after the surveyors begin, which may require clearing in higher elevations where tree removal is required prior to road construction. After a couple of weeks of road construction another survey crew can begin staking the structure locations. A week or two after the survey crew starts staking structure locations; excavation of holes for foundations can begin. The installation of the concrete pier foundations would begin immediately after that. The foundations need time to cure and develop to full structural strength (i.e., compression capacity) before lattice structures or mono-pole structures can be installed. A couple weeks after foundation installation has begun, lattice-structure and mono-pole hauling, assembly, and erection can begin. For 345kV H-frame construction, structure assembly and setting can begin immediately after the excavation of holes has begun. The wire installation crews would start approximately 8 to 12 weeks after assembly and erection/setting begins. This would be followed by final cleanup, reclamation, and restoration. Substation construction includes five activities: (1) site grading (grading and access road development); (2) below-grade construction (primarily the installation of foundations); (3) above-grade construction (steel erection and building construction); (4) electrical (installation and termination of control wiring); and (5) testing (functional testing of control and monitoring schemes). Typically, these activities overlap and complement each other, allowing the construction of a substation to proceed more quickly than transmission-line construction. It is estimated that the site-grading activity and access-road work for Gateway South series compensation substations would take 4 to 8 weeks to complete, depending on the size of the site.

Below-grade construction can be completed in 3 months or less for all substations that are expansions of existing substations. In these cases the basic infrastructure is already in place, having been installed with the initial substation and designed for the future expansion requirements. Only the new substations would take longer to complete.

Above-grade construction duration is highly dependent on the level of construction workforce the contractor chooses. Due to the size of each station, many crews can work on steel erection and equipment assembly without interfering with each other. The greatest amount of schedule recovery or acceleration in a station's construction schedule can be achieved during this timeframe. It is estimated that, for the series compensation substations, the erection of steel, bus assembly, and major equipment assembly can be completed in between 4 and 6 months.

Electrical construction is a long and labor-intensive task. Although multiple crews can work in a yard at any given time, the space in a control building is very limited and would determine the length of this task. In the case of each of these stations, given the size and type of equipment to be installed, there would be miles of cable to be pulled into conduit and duct banks and thousands of connections to be made and double checked prior to the start of testing. The series compensation substations would take longer than existing substations that already have the basic infrastructure in place.

Prior to starting construction, the Company may be required to conduct on-site environmental surveys in accordance with applicable protocols or mitigation measures adopted by BLM and other agencies as Project conditions. Accordingly, adjustments might occur to the Project schedule as necessary to avoid sensitive resources and comply with the approved Construction POD. Pre-construction activities, including pre-construction environmental surveys, materials procurement, design, contracting, right-of-way acquisition, and permitting efforts, are not shown in the summary schedule.

The schedule is predicated upon the Company's ability to complete the following tasks in a timely manner:

- Secure all necessary permit approvals
- Secure agency approval
- Complete biological and cultural survey work
- Construct within environmental time constraints
- Order and receive equipment
- Secure construction contractor resources and associated construction equipment. Maintain continuous construction activity with no delay due to environmental, administrative, or legal issues.

Table 8a Project Duration Schedule – Months 1 to 8																																		
Spread 1 – 228 Miles (W15, W21, W35, W36, W30, W32, W101, W125, W108, W116, W113, W410, W411, C31, C61, C91, C175, C186, C188)	2015																																	
	Month 1				Month 2				Month 3				Month 4				Month 5				Month 6				Month 7				Month 8					
	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/7	3/14	3/21	3/28	4/4	4/11	4/18	4/25	5/2	5/9	5/16	5/23	5/30	6/6	6/13	6/20	6/27	7/4	7/11	7/18	7/25	8/1	8/8	8/15	8/22
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204
Inspection	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Wk 14	Wk 15	Wk 16	Wk 17	Wk 18	Wk 19	Wk 20	Wk 21	Wk 22	Wk 23	Wk 24	Wk 25	Wk 26	Wk 27	Wk 28	Wk 29	Wk 30	Wk 31	Wk 32	Wk 33	Wk 34
Project yard(s) layout and make ready for construction	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																		
Receipt and storage and Project materials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Survey and stake access roads and work areas									1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Construct access roads and structure pads											1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Tree clearing																																		
Install foundations																			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Haul and assemble structures																										1	2	3	4	5	6	7	8	9
Erect structures																																		
Install overhead optical ground wire, overhead ground wire, and conductors																																		
Cleanup and restoration																																		
Spread 2 – 103 Miles (U242, U280, U285, U300, U400, U401, U404, U406)	2015																																	
	Month 1				Month 2				Month 3				Month 4				Month 5				Month 6				Month 7				Month 8					
	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/7	3/14	3/21	3/28	4/4	4/11	4/18	4/25	5/2	5/9	5/16	5/23	5/30	6/6	6/13	6/20	6/27	7/4	7/11	7/18	7/25	8/1	8/8	8/15	8/22
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204
Inspection	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Wk 14	Wk 15	Wk 16	Wk 17	Wk 18	Wk 19	Wk 20	Wk 21	Wk 22	Wk 23	Wk 24	Wk 25	Wk 26	Wk 27	Wk 28	Wk 29	Wk 30	Wk 31	Wk 32	Wk 33	Wk 34
Project yard(s) layout and make ready for construction														1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16					
Receipt and storage and project materials														1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Survey and stake access roads and work areas																							1	2	3	4	5	6	7	8	9	10	11	12
Construct access roads and structure pads																										1	2	3	4	5	6	7	8	
Tree clearing																					1	2	3	4	5	6	7	8	9	10	11	12	13	14
Install foundations																																		1
Haul and assemble structures																																		
Erect structures																																		
Install overhead optical ground wire, overhead ground wire, and conductors																																		
Cleanup and restoration																																		
Spread 3 – 76 Miles (U525, U435, U545, U546, U548, U600, U636, U637, U639, U650, U640)	2015																																	
	Month 1				Month 2				Month 3				Month 4				Month 5				Month 6				Month 7				Month 8					
	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/7	3/14	3/21	3/28	4/4	4/11	4/18	4/25	5/2	5/9	5/16	5/23	5/30	6/6	6/13	6/20	6/27	7/4	7/11	7/18	7/25	8/1	8/8	8/15	8/22
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204
Inspection	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Wk 14	Wk 15	Wk 16	Wk 17	Wk 18	Wk 19	Wk 20	Wk 21	Wk 22	Wk 23	Wk 24	Wk 25	Wk 26	Wk 27	Wk 28	Wk 29	Wk 30	Wk 31	Wk 32	Wk 33	Wk 34
Project yard(s) layout and make ready for construction																															1	2	3	4
Receipt and storage and Project materials																															1	2	3	4
Survey and stake access roads and work areas																																		
Construct access roads and structure pads																																		
Tree clearing																																		
Install foundations																																		
Haul and assemble structures																																		
Erect structures																																		
Install overhead optical ground wire, overhead ground wire, and conductors																																		
Cleanup and restoration																																		

Spread 1 – 228 Miles (W15, W21, W35, W36, W30, W32, W101, W125, W108, W116, W113, W410, W411, C31, C61, C91, C175, C186, C188)	2015																		2016																	
	Month 9					Month 10					Month 11				Month 12				Month 13				Month 14				Month 15				Month 16					
	8/29	9/5	9/12	9/19	9/26	10/3	10/10	10/17	10/24	10/31	11/7	11/14	11/21	11/28	12/5	12/12	12/19	12/26	1/2	1/9	1/16	1/23	1/30	2/6	2/13	2/20	2/27	3/5	3/12	3/19	3/26	4/2	4/9	4/16	4/23	
	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330	336	342	348	354	360	366	372	378	384	390	396	402	408	414	
	Wk 35	Wk 36	Wk 37	Wk 38	Wk 39	Wk 40	Wk 41	Wk 42	Wk 43	Wk 44	Wk 45	Wk 46	Wk 47	Wk 48	Wk 49	Wk 50	Wk 51	Wk 52	Wk 53	Wk 54	Wk 55	Wk 56	Wk 57	Wk 58	Wk 59	Wk 60	Wk 61	Wk 62	Wk 63	Wk 64	Wk 65	Wk 66	Wk 67	Wk 68	Wk 69	
Inspection	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	
Project yard(s) layout and make ready for construction	35	36	37	38	39	40	41	42	43	44	45	46	47																							
Receipt and storage and Project materials														48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	
Survey and stake access roads and work areas	35	36	37	38	39	40	41	42	43	44	45	46	47	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	
Construct access roads and structure pads	27	28	29	30	31	32	33	34	35	36	37	38	39	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	
Tree clearing	25	26	27	28	29	30	31	32	33	34	35	36	37																							
Install foundations														30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
Haul and assemble structures	17	18	19	20	21	22	23	24	25	26	27	28	29	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	
Erect structures	10	11	12	13	14	15	16	17	18	19	20	21	22	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Install overhead optical ground wire, overhead ground wire, and conductors					1	2	3	4	5	6	7	8	9	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Cleanup and restoration												1													1	2	3	4	5	6	7	8	9	10	11	
Spread 2 – 103 Miles (U242, U280, U285, U300, U400, U401, U404, U406)	2015																		2016																	
	Month 9					Month 10					Month 11				Month 12				Month 13				Month 14				Month 15				Month 16					
	8/29	9/5	9/12	9/19	9/26	10/3	10/10	10/17	10/24	10/31	11/7	11/14	11/21	11/28	12/5	12/12	12/19	12/26	1/2	1/9	1/16	1/23	1/30	2/6	2/13	2/20	2/27	3/5	3/12	3/19	3/26	4/2	4/9	4/16	4/23	
	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330	336	342	348	354	360	366	372	378	384	390	396	402	408	414	
	Wk 35	Wk 36	Wk 37	Wk 38	Wk 39	Wk 40	Wk 41	Wk 42	Wk 43	Wk 44	Wk 45	Wk 46	Wk 47	Wk 48	Wk 49	Wk 50	Wk 51	Wk 52	Wk 53	Wk 54	Wk 55	Wk 56	Wk 57	Wk 58	Wk 59	Wk 60	Wk 61	Wk 62	Wk 63	Wk 64	Wk 65	Wk 66	Wk 67	Wk 68	Wk 69	
Inspection	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	
Project yard(s) layout and make ready for construction																																				
Receipt and storage and Project materials	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	
Survey and stake access roads and work areas	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	
Construct access roads and structure pads	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	
Tree clearing	15	16	17	18	19	20	21																													
Install foundations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
Haul and assemble structures							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Erect structures																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Install overhead optical ground wire, overhead ground wire, and conductors																										1	2	3	4	5	6	7	8	9		
Cleanup and restoration																																				
Spread 3 – 76 Miles (U525, U435, U545, U546, U548, U600, U636, U637, U639, U650, U640)	2015																		2016																	
	Month 9					Month 10					Month 11				Month 12				Month 13				Month 14				Month 15				Month 16					
	8/29	9/5	9/12	9/19	9/26	10/3	10/10	10/17	10/24	10/31	11/7	11/14	11/21	11/28	12/5	12/12	12/19	12/26	1/2	1/9	1/16	1/23	1/30	2/6	2/13	2/20	2/27	3/5	3/12	3/19	3/26	4/2	4/9	4/16	4/23	
	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330	336	342	348	354	360	366	372	378	384	390	396	402	408	414	
	Wk 35	Wk 36	Wk 37	Wk 38	Wk 39	Wk 40	Wk 41	Wk 42	Wk 43	Wk 44	Wk 45	Wk 46	Wk 47	Wk 48	Wk 49	Wk 50	Wk 51	Wk 52	Wk 53	Wk 54	Wk 55	Wk 56	Wk 57	Wk 58	Wk 59	Wk 60	Wk 61	Wk 62	Wk 63	Wk 64	Wk 65	Wk 66	Wk 67	Wk 68	Wk 69	
Inspection	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	
Project yard(s) layout and make ready for construction	5	6	7	8	9	10	11	12	13	14	15	16																								
Receipt and storage and Project materials	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	
Survey and stake access roads and work areas	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Construct access roads and structure pads							1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Tree clearing																			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Install foundations																																				
Haul and assemble structures																																				
Erect structures																																				
Install overhead optical ground wire, overhead ground wire, and conductors																																				
Cleanup and restoration																																				

Table 8c Project Duration Schedule – Months 17 to 24																																				
Spread 1 – 228 Miles (W15, W21, W35, W36, W30, W32, W101, W125, W108, W116, W113, W410, W411, C31, C61, C91, C175, C186, C188)	2016																																			
	Month 17				Month 18				Month 19				Month 20				Month 21				Month 22				Month 23				Month 24							
	4/30	5/7	5/14	5/21	5/28	6/4	6/11	6/18	6/25	7/2	7/9	7/16	7/23	7/30	8/6	8/13	8/20	8/27	9/3	9/10	9/17	9/24	10/1	10/8	10/15	10/22	10/29	11/5	11/12	11/19	11/26	12/3	12/10	12/17	12/24	
	420	426	432	438	444	450	456	462	468	474	480	486	492	498	504	510	516	522	528	534	540	546	552	558	564	570	576	582	588	594	600	606	612	618	624	
	Wk 70	Wk 71	Wk 72	Wk 73	Wk 74	Wk 75	Wk 76	Wk 77	Wk 78	Wk 79	Wk 80	Wk 81	Wk 82	Wk 83	Wk 84	Wk 85	Wk 86	Wk 87	Wk 88	Wk 89	Wk 90	Wk 91	Wk 92	Wk 93	Wk 94	Wk 95	Wk 96	Wk 97	Wk 98	Wk 99	Wk 100	Wk 101	Wk 102	Wk 103	Wk 104	
Inspection	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	
Project yard(s) layout and make ready for construction																																				
Receipt and storage and Project materials	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	
Survey and stake access roads and work areas	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85												
Construct access roads and structure pads	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85										
Tree clearing																																				
Install foundations	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84			
Haul and assemble structures	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	
Erect structures	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	
Install overhead optical ground wire, overhead ground wire, and conductors	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	
Cleanup and restoration	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	
Spread 2 – 103 Miles (U242, U280, U285, U300, U400, U401, U404, U406)	2016																																			
	Month 17				Month 18				Month 19				Month 20				Month 21				Month 22				Month 23				Month 24							
	4/30	5/7	5/14	5/21	5/28	6/4	6/11	6/18	6/25	7/2	7/9	7/16	7/23	7/30	8/6	8/13	8/20	8/27	9/3	9/10	9/17	9/24	10/1	10/8	10/15	10/22	10/29	11/5	11/12	11/19	11/26	12/3	12/10	12/17	12/24	
	420	426	432	438	444	450	456	462	468	474	480	486	492	498	504	510	516	522	528	534	540	546	552	558	564	570	576	582	588	594	600	606	612	618	624	
	Wk 70	Wk 71	Wk 72	Wk 73	Wk 74	Wk 75	Wk 76	Wk 77	Wk 78	Wk 79	Wk 80	Wk 81	Wk 82	Wk 83	Wk 84	Wk 85	Wk 86	Wk 87	Wk 88	Wk 89	Wk 90	Wk 91	Wk 92	Wk 93	Wk 94	Wk 95	Wk 96	Wk 97	Wk 98	Wk 99	Wk 100	Wk 101	Wk 102	Wk 103	Wk 104	
Inspection	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	
Project yard(s) layout and make ready for construction																																				
Receipt and storage and Project materials	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82										
Survey and stake access roads and work areas																																				
Construct access roads and structure pads	44	45	46	47																																
Tree clearing																																				
Install foundations	37	38	39	40	41	42																														
Haul and assemble structures	30	31	32	33	34	35	36	37	38	39	40	41	42																							
Erect structures	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37																			
Install overhead optical ground wire, overhead ground wire, and conductors	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35										
Cleanup and restoration			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
Spread 3 – 76 Miles (U525, U435, U545, U546, U548, U600, U636, U637, U639, U650, U640)	2016																																			
	Month 17				Month 18				Month 19				Month 20				Month 21				Month 22				Month 23				Month 24							
	4/30	5/7	5/14	5/21	5/28	6/4	6/11	6/18	6/25	7/2	7/9	7/16	7/23	7/30	8/6	8/13	8/20	8/27	9/3	9/10	9/17	9/24	10/1	10/8	10/15	10/22	10/29	11/5	11/12	11/19	11/26	12/3	12/10	12/17	12/24	
	420	426	432	438	444	450	456	462	468	474	480	486	492	498	504	510	516	522	528	534	540	546	552	558	564	570	576	582	588	594	600	606	612	618	624	
	Wk 70	Wk 71	Wk 72	Wk 73	Wk 74	Wk 75	Wk 76	Wk 77	Wk 78	Wk 79	Wk 80	Wk 81	Wk 82	Wk 83	Wk 84	Wk 85	Wk 86	Wk 87	Wk 88	Wk 89	Wk 90	Wk 91	Wk 92	Wk 93	Wk 94	Wk 95	Wk 96	Wk 97	Wk 98	Wk 99	Wk 100	Wk 101	Wk 102	Wk 103	Wk 104	
Inspection	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
Project yard(s) layout and make ready for construction																																				
Receipt and storage and Project materials	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
Survey and stake access roads and work areas	36	37	38	39	40	41	42	43	44																											
Construct access roads and structure pads	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44																				
Tree clearing	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32																					
Install foundations							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Haul and assemble structures														1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Erect structures																							1	2	3	4	5	6	7	8	9	10	11	12	13	14
Install overhead optical ground wire, overhead ground wire, and conductors																											1	2	3	4	5	6	7	8	9	
Cleanup and restoration																																				

Table 8d Project Duration Schedule – Months 25 to 32																																		
Spread 1 – 228 Miles (W15, W21, W35, W36, W30, W32, W101, W125, W108, W116, W113, W410, W411, C31, C61, C91, C175, C186, C188)	2017																																	
	Month 25				Month 26				Month 27				Month 28				Month 29				Month 30				Month 31				Month 32					
	12/31	1/7	1/14	1/21	1/28	2/4	2/11	2/18	2/25	3/4	3/11	3/18	3/25	4/1	4/8	4/15	4/22	4/29	5/6	5/13	5/20	5/27	6/3	6/10	6/17	6/24	7/1	7/8	7/15	7/22	7/29	8/5	8/12	8/19
	630	636	642	648	654	660	666	672	678	684	690	696	702	708	714	720	726	732	738	744	750	756	762	768	774	780	786	792	798	804	810	816	822	828
	Wk 105	Wk 106	Wk 107	Wk 108	Wk 109	Wk 110	Wk 111	Wk 112	Wk 113	Wk 114	Wk 115	Wk 116	Wk 117	Wk 118	Wk 119	Wk 120	Wk 121	Wk 122	Wk 123	Wk 124	Wk 125	Wk 126	Wk 127	Wk 128	Wk 129	Wk 130	Wk 131	Wk 132	Wk 133	Wk 134	Wk 135	Wk 136	Wk 137	Wk 138
Inspection	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121																	
Project yard(s) layout and make ready for construction																																		
Receipt and storage and Project materials	105	106	107	108	109	110	111	112	113	114																								
Survey and stake access roads and work areas																																		
Construct access roads and structure pads																																		
Tree clearing																																		
Install foundations																																		
Haul and assemble structures	80	81	82	83	84																													
Erect structures	67	68	69	70	71	72																												
Install overhead optical ground wire, overhead ground wire, and conductors	59	60	61	62	63	64	65	66	67	68																								
Cleanup and restoration	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63																	
Spread 2 – 103 Miles (U242, U280, U285, U300, U400, U401, U404, U406)	2017																																	
	Month 25				Month 26				Month 27				Month 28				Month 29				Month 30				Month 31				Month 32					
	12/31	1/7	1/14	1/21	1/28	2/4	2/11	2/18	2/25	3/4	3/11	3/18	3/25	4/1	4/8	4/15	4/22	4/29	5/6	5/13	5/20	5/27	6/3	6/10	6/17	6/24	7/1	7/8	7/15	7/22	7/29	8/5	8/12	8/19
	630	636	642	648	654	660	666	672	678	684	690	696	702	708	714	720	726	732	738	744	750	756	762	768	774	780	786	792	798	804	810	816	822	828
	Wk 105	Wk 106	Wk 107	Wk 108	Wk 109	Wk 110	Wk 111	Wk 112	Wk 113	Wk 114	Wk 115	Wk 116	Wk 117	Wk 118	Wk 119	Wk 120	Wk 121	Wk 122	Wk 123	Wk 124	Wk 125	Wk 126	Wk 127	Wk 128	Wk 129	Wk 130	Wk 131	Wk 132	Wk 133	Wk 134	Wk 135	Wk 136	Wk 137	Wk 138
Inspection																																		
Project yard(s) layout and make ready for construction																																		
Receipt and storage and Project materials																																		
Survey and stake access roads and work areas																																		
Construct access roads and structure pads																																		
Tree clearing																																		
Install foundations																																		
Haul and assemble structures																																		
Erect structures																																		
Install overhead optical ground wire, overhead ground wire, and conductors																																		
Cleanup and restoration																																		
Spread 3 – 76 Miles (U525, U435, U545, U546, U548, U600, U636, U637, U639, U650, U640)	2017																																	
	Month 25				Month 26				Month 27				Month 28				Month 29				Month 30				Month 31				Month 32					
	12/31	1/7	1/14	1/21	1/28	2/4	2/11	2/18	2/25	3/4	3/11	3/18	3/25	4/1	4/8	4/15	4/22	4/29	5/6	5/13	5/20	5/27	6/3	6/10	6/17	6/24	7/1	7/8	7/15	7/22	7/29	8/5	8/12	8/19
	630	636	642	648	654	660	666	672	678	684	690	696	702	708	714	720	726	732	738	744	750	756	762	768	774	780	786	792	798	804	810	816	822	828
	Wk 105	Wk 106	Wk 107	Wk 108	Wk 109	Wk 110	Wk 111	Wk 112	Wk 113	Wk 114	Wk 115	Wk 116	Wk 117	Wk 118	Wk 119	Wk 120	Wk 121	Wk 122	Wk 123	Wk 124	Wk 125	Wk 126	Wk 127	Wk 128	Wk 129	Wk 130	Wk 131	Wk 132	Wk 133	Wk 134	Wk 135	Wk 136	Wk 137	Wk 138
Inspection	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	
Project yard(s) layout and make ready for construction																																		
Receipt and storage and Project materials	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98										
Survey and stake access roads and work areas																																		
Construct access roads and structure pads																																		
Tree clearing																																		
Install foundations	30	31	32	33																														
Haul and assemble structures	23	24	25	26	27	28	29	30	31	32	33																							
Erect structures	15	16	17	18	19	20	21	22	23	24	25	26	27	28																				
Install overhead optical ground wire, overhead ground wire, and conductors	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33										
Cleanup and restoration	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	

4 SYSTEM OPERATION AND MAINTENANCE

The 500kV transmission lines to be constructed as part of the Project comprise critical infrastructure of the Company's transmission system, and of the western U.S. electrical grid. Limiting the duration of unplanned outages and planning for the use of live-line maintenance techniques to minimize the requirement for any outages is an important part of the design, construction, and operation/maintenance requirements for this Project.

Operation and maintenance activities would be performed in accordance with direction in the approved Construction POD and right-of-way grant.

4.1 Routine System Operation and Maintenance

The goal of the Company is to provide its customers with a reliable supply of electricity while maintaining the overall integrity of the regional electrical grid. The Company's obligation to maintain reliable operation of the electrical system is documented in the Company's agreements with the various states through the Public Service Commissions and is directed through compliance with industry standard codes and practices such as the National Electrical Safety Code (ANSI C2), which governs the design and operation of high-voltage electric-utility systems.

In 2005, Congress passed the Energy Policy Act of 2005, which provided a regulatory basis for the implementation of specific incentives (and penalties) for maintaining reliable service, among other issues. As a result of the passage of the Act, the Federal Energy Regulatory Commission selected the NERC to act as the enforcement agency for compliance with electric utility reliability and operating standards, among other issues. The Company is required to be in compliance with the various reliability standards promulgated through the implementation of the NERC policies and procedures. Additionally, the Company is governed by the WECC standards that may be in addition to or more stringent than those currently required by NERC. In response, the Company has prepared internal operation and maintenance policies and procedures designed to meet the requirements of the NERC, WECC, and the state public utility commissions, while remaining in compliance with the applicable codes and standards with respect to maintaining the reliability of the electrical system.

Operation and maintenance activities would include transmission line patrols, climbing inspections, structure and wire inspection and maintenance, insulator washing in selected areas as needed, and access roads repairs. The Company would keep necessary work areas around structures clear of vegetation and would limit the height of vegetation along the right-of-way. Periodic inspection and maintenance of each of the substations and communications facilities is also a key part of operating and maintaining the electrical system. The following sections provide details on the anticipated operation and maintenance activities for Gateway South.

After the transmission line has been energized, land uses that are compatible with safety regulations would be permitted in and adjacent to the right-of-way. Existing land uses such as agriculture and grazing are generally permitted within the right-of-way. Incompatible land uses within the right-of-way include construction and maintenance of inhabited dwellings and any use requiring changes in surface elevation that would affect electrical clearances of existing or planned facilities.

Land uses that comply with local regulations would be permitted adjacent to the right-of-way. Compatible uses of the right-of-way on public lands would have to be approved by the appropriate agency. Permission to use the easement on private lands would have to be obtained from the utility owning the transmission line.

4.1.1 Routine System Inspection, Maintenance, and Repair

Regular inspection of transmission lines, substations, and support systems is critical for safe, efficient, and economical operation of the Project.

4.1.2 Transmission Line Maintenance

Regular ground and aerial inspections would be performed in accordance with the Company's established policies and procedures for transmission line inspection and maintenance. The Company's transmission lines and substations would be inspected for corrosion, equipment misalignment, loose fittings, vandalism, and other mechanical problems. The need for vegetation management would also be determined during inspection patrols.

Inspection of the entire transmission line system would be conducted three times annually. Aerial inspection would be conducted by helicopter on an annual basis and would require two or three crew members, including the pilot. Detailed ground inspections would take place on a semi-annual basis using existing access roads to each structure. Ground inspection would use four-wheel-drive trucks or four-wheel-drive ATVs. The inspector would assess the condition of the transmission line and hardware to determine if any components need to be repaired or replaced, or if other conditions exist that require maintenance or modification activities. The inspector also would note any unauthorized encroachments and trash dumping on the right-of-way that could constitute a safety hazard. The inspector would access each of the structure locations along each line and use binoculars and spotting scopes to perform this inspection.

4.1.3 Hardware Maintenance and Repairs

Routine maintenance activities are ordinary maintenance tasks that historically have been performed and are regularly carried out on a routine basis. The work performed typically is repair or replacement of individual components (no new ground disturbance), performed by relatively small crews using a minimum of equipment, and usually is conducted within a period from a few hours up to a few days. Work requires access to the damaged portion of the line to allow for a safe and efficient repair of the facility. Equipment required for this work may include four-wheel-drive trucks, material (flatbed) trucks, cranes, bucket trucks (low-reach), boom trucks (high-reach), or man lifts. This work is scheduled and typically is required due to issues found during inspections. Typical items that may require periodic replacement on a 500kV structure include insulators, hardware, or structure members. It is expected that these replacements would be required infrequently.

The Company plans to conduct maintenance on the critical 500kV and 345kV system using live-line maintenance techniques. Maintenance on the transmission lines can be completed safely using live-line techniques, thereby avoiding an outage to the critical transmission-line infrastructure. High-reach bucket trucks along with other equipment are used to conduct these activities.

For the 345kV and 500kV structures, this requires that adequate space be available at each structure site so that the high reach bucket truck can be positioned to one side or the other of the structure and reach up and over the lower phases to access the upper center phase for live-line maintenance procedures.

For the 345kV H-frame structures, this requires that adequate space be available at each structure site so that a bucket truck can be positioned to access the outside phases. To allow room at each structure for these activities, in low-slope areas, a pad area of 250 feet (right-of-way width) by 140 feet is required with the structure in the center for the single-circuit 500kV structure, and 150 by 100 feet for the 345kV H-frame structure. Figures 11 and 12 depict the space requirements for live-line maintenance. The size

and location of these required pads near the structures may vary depending on the side slope and access road at each site. The work areas and pads would be cleared to the extent needed to safely complete the work. These pads would remain in place after construction, but would be revegetated after the construction has been completed.

4.1.4 Access Road and Work Area Repair

Right-of-way repairs include grading, vegetation management of existing maintenance access roads and work areas, and spot repair of sites subject to flooding or scouring. All road-maintenance standards, such as maintaining cross-road drainage and replacing road-drainage structures, would be compliant with those of the agency managing the land. Required equipment may include a grader, backhoe, four-wheel-drive pickup truck, and a cat-loader or bulldozer. The cat-loader has steel tracks whereas the grader, backhoe, and truck typically have rubber tires. Repair of the right-of-way would be scheduled as a result of line inspections, or would occur in response to an emergency situation. Scheduling of these activities would attempt to adhere to specific biological seasonal restriction timeframes identified in the Construction POD and would be coordinated ahead of time with land-management agency unless it is an emergency situation.

4.1.5 Vegetation Management

The Company must maintain work areas adjacent to electrical transmission structures and along the right-of-way for vehicle and equipment access required for operations, maintenance, and repair, including for live-line maintenance activities as described above under Section 4.1.3 – Hardware Maintenance and Repairs. Shrubs and other obstructions would be removed regularly near structures to facilitate inspection and maintenance of equipment and to ensure system reliability.

Vegetation management practices along the right-of-way would be in accordance with the Company clearing specifications and vegetation management plans (PacifiCorp 2007). Much of the transmission-line alternative routes traverse arid country characterized by low-growing vegetation, while higher elevations receive more precipitation and exhibit more vegetation. The wire-border zone method to controlling vegetation is an approach used by the Company (PacifiCorp 2007). This method results in two zones of clearing and revegetation. The wire zone is the linear area along the right-of-way under the wires and extending 10 feet outside of the outermost phase conductor. After initial clearing, vegetation in the wire zone would be maintained to consist of native grasses, legumes, herbs, ferns, and other low-growing shrubs that remain under 5-feet tall at maturity. The border zone is the linear area along each side of the right-of-way extending from the wire zone to the edge of the right-of-way.

Vegetation in the border zone would be maintained to consist of tall shrubs or short trees (up to 25-feet tall at maturity), grasses, and forbs. These cover/herbaceous plants benefit the right-of-way by competing with and excluding undesirable plants. The width of the wire and border zones is depicted in Figure 13 for the 345kV H-frame and 500kV single-circuit structure line segments. During operations, vegetation growth would be monitored and managed to maintain the wire-border zone objectives. When conductor ground clearance is greater than 50 feet, for example a canyon or ravine crossing with high ground clearance at mid-span, trees and shrubs would be left in place as long as the conductor clearance to the vegetation tops is 50 feet or more (Figure 14).

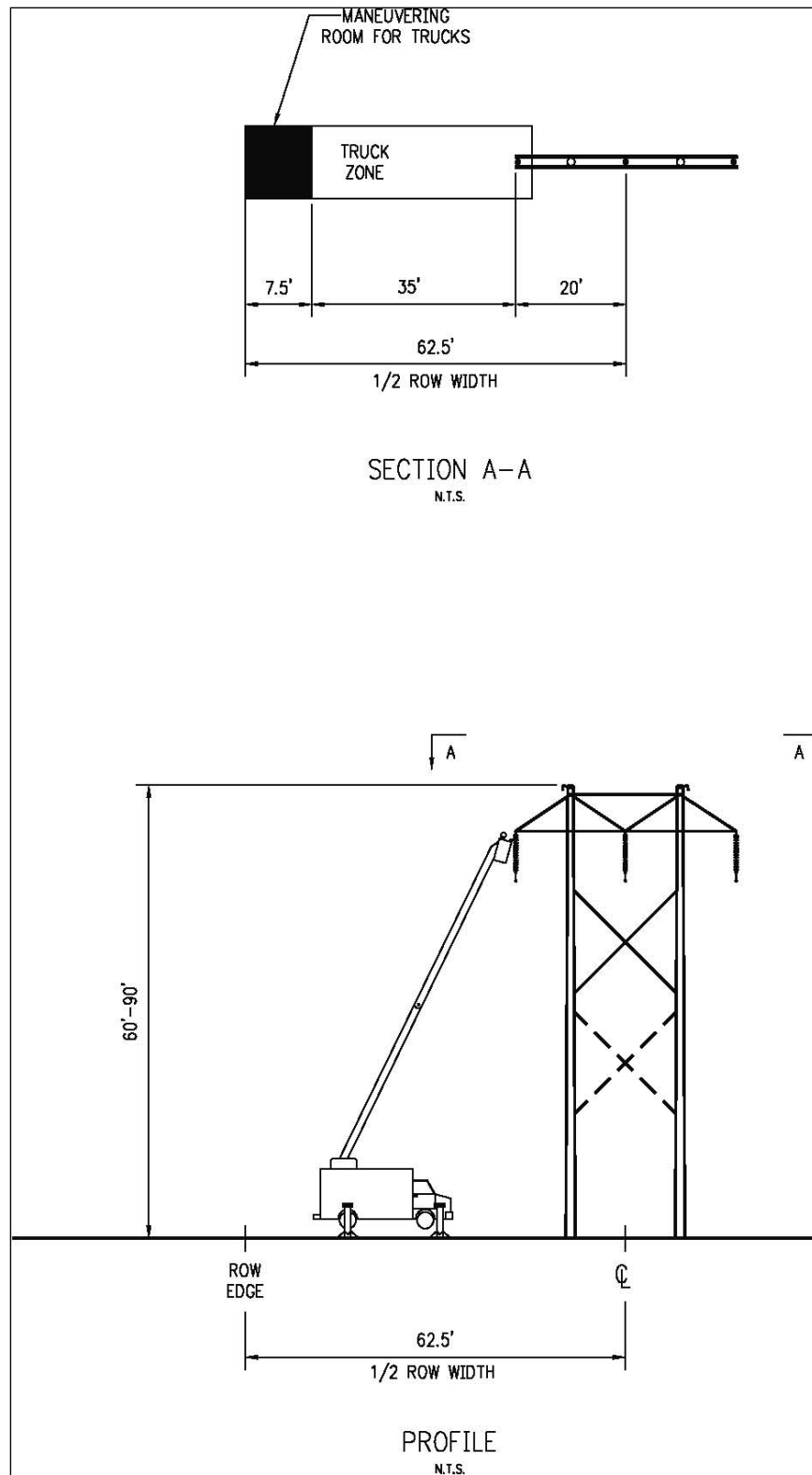
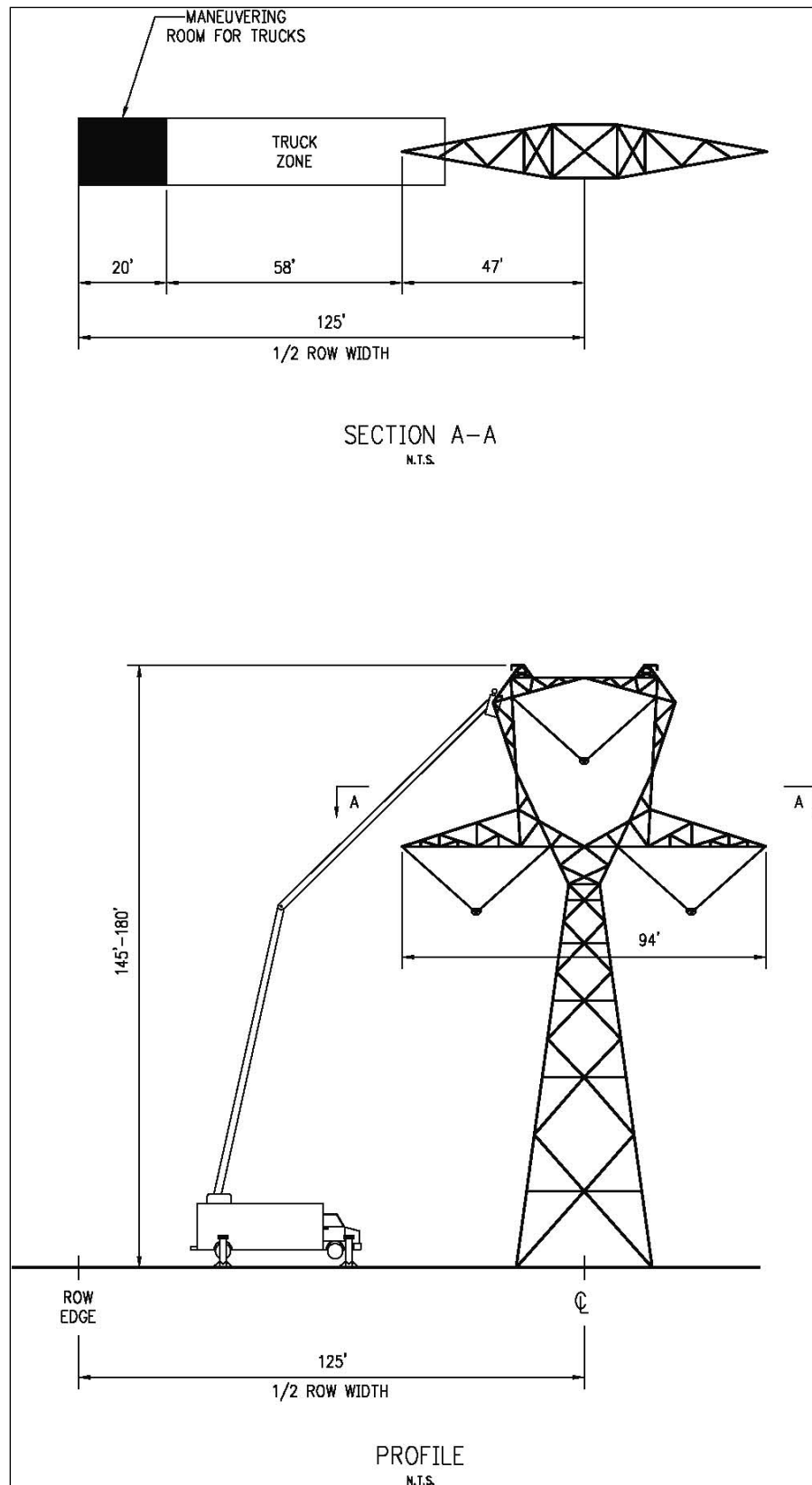


Figure 11 Live-line Maintenance Space Requirements, Single-circuit 345-kilovolt Line

**Figure 12 Live-line Maintenance Space Requirements, Single-circuit 500-kilovolt Line**

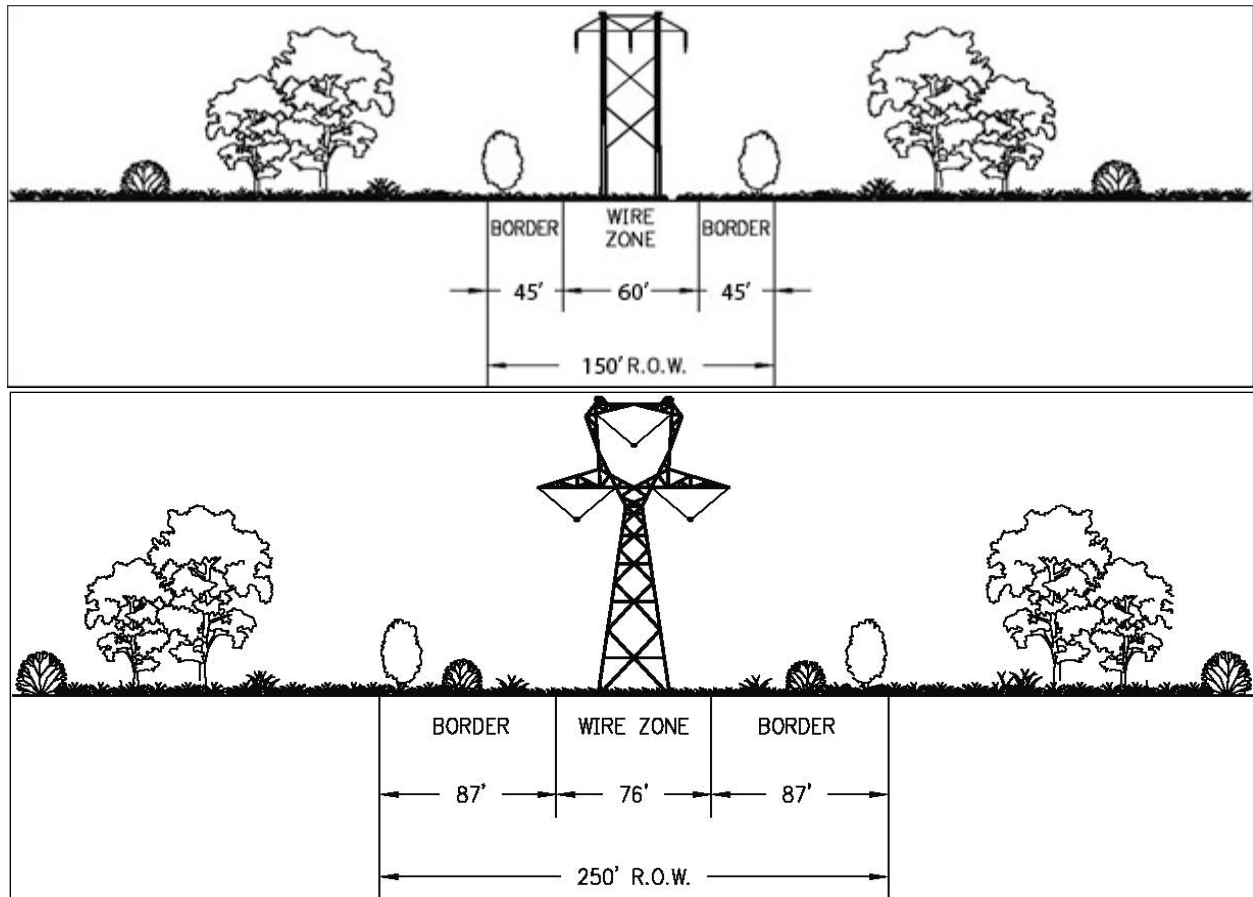


Figure 13 Single-circuit 345-kilovolt Line (top), Single-circuit 500-kilovolt Line (bottom)

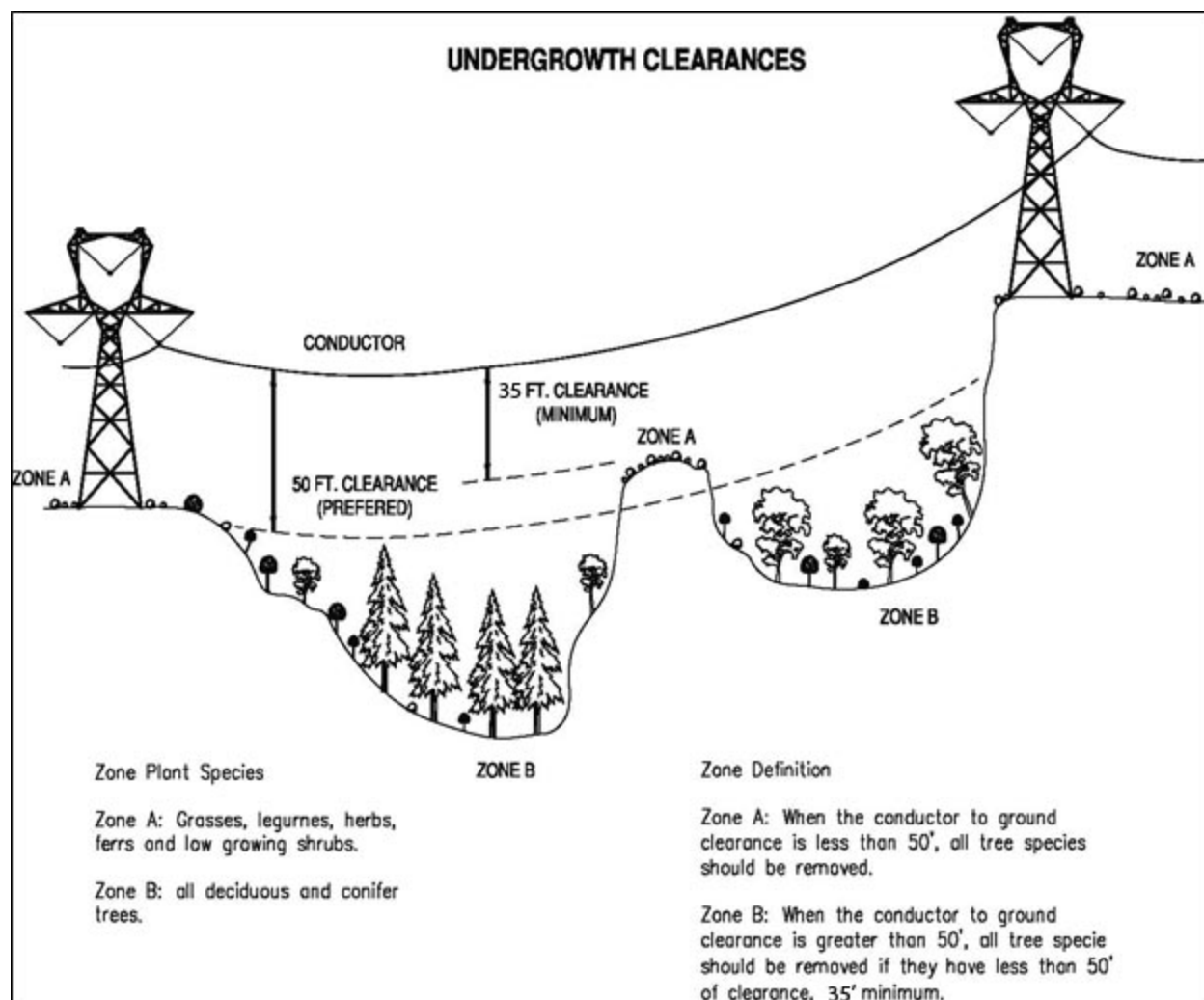


Figure 14 Right-of-way Vegetation Management in Steep Terrain

4.1.6 Substation and Regeneration Station Maintenance

Substation and regeneration station monitoring and control functions are performed remotely from the Company's central operations facilities located at Company's operation center in Portland, Oregon. Unauthorized entry into substations or regeneration stations is prevented with the provision of fencing and locked gates. Warning signs would be posted and entry to the operating facilities would be restricted to authorized personnel. Gateway South substations and regeneration stations would not be staffed; however, a remotely monitored security system would be installed. Several forms of security are planned for each of the locations, although the security arrangements at each of the substations or regeneration stations may differ somewhat. Security measures may include fire detection in the control building via the remote monitoring system; alarming for forced entry; and a perimeter security system coupled with remote sensing infrared camera equipment in the fenced area of the station to provide visual observation/confirmation to the system operator of disturbances at the fence line.

Maintenance activities include equipment testing, equipment monitoring and repair, and emergency and routine procedures for service continuity and preventive maintenance. It is anticipated that maintenance at each substation would require approximately six trips per year by a two- to four-person crew. Routine

operations would require one or two workers in a light utility truck to visit the substations monthly. Typically, once per year a major maintenance inspection would take place requiring up to 15 personnel for 1 to 3 weeks. Regeneration stations would be visited every 2 to 3 months by one individual in a light truck to inspect the facilities. Annual maintenance would be performed by a two man crew in a light truck over a 2- to 5-day period. If substation landscaping is required by the permitting agency, drought-tolerant plant materials would be used to minimize watering requirements after plant establishment.

Safety lighting at the substations would be provided inside the substation fence for the purpose of emergency repair work. Because night activities are not expected to occur more than once per year, the safety lighting inside the substation fence normally would be turned off. One floodlight, mounted near the entry gate to safely illuminate the substation entry gate, may be left on during nighttime hours.

4.2 Emergency Response

The operation of the system is remotely managed and monitored from control rooms at the Company's operation center in Portland, Oregon. Electrical outages or variations from normal operating protocols would be sensed and reported at these operation centers. As well, the substations are equipped with remote monitoring, proximity alarms, and in some cases video surveillance.

The implementation of routine operation and maintenance activities on powerlines would minimize the need for most emergency repairs. Emergency maintenance activities are often those activities necessary to repair natural hazard, fire, or human-caused damages to a line. Such work is required to eliminate a safety hazard, prevent imminent damage to the powerline, or restore service if there is an outage. In an emergency, the Company must respond as quickly as possible to restore power.

The equipment necessary to accomplish emergency repairs is similar to that required to conduct routine maintenance, in most cases. Emergency response to outages may require additional equipment to complete the repairs. For example, where the site of the outage is remote, helicopters may be used to respond quickly to emergencies. Emergency vehicle access to private property also would be maintained.

In practice, as soon as an incident is detected, the control-room dispatchers would notify the responsible operations staff in the area(s) affected and crews and equipment would be organized and dispatched to respond to the incident.

4.2.1 Fire Protection

All federal, state, and county laws, ordinances, rules, and regulations pertaining to fire prevention and suppression would be strictly adhered to. All personnel would be advised of their responsibilities under the applicable fire laws and regulations.

When working on public or National Forest System land, the Company's employees and contractor's vehicles would be equipped with approved suppression tools and equipment. The Applicant or their construction contractor would notify local fire authorities and the BLM or USFS (as appropriate) if a Project-related fire occurs within or adjacent to a construction area a complete fire protection plan would be developed as part of the Construction POD.

If the Company becomes aware of an emergency situation that is caused by a fire on or threatening BLM- or USFS-managed land and that could damage the transmission lines or its operation, it would notify the appropriate agency and emergency office contact. Specific construction-related activities and safety measures would be implemented during construction of the transmission line to prevent fires and to ensure quick response and suppression if a fire occurs. Typical practices to prevent fires during

construction and maintenance/repair activities include brush clearing prior to work, prohibit burning of slash, stationing a water truck at the job site to keep the ground and vegetation moist in extreme fire conditions, enforcing red flag warnings, providing “fire behavior” training to all pertinent personnel, keeping vehicles on or within designated roads or work areas, equip all construction equipment operating with internal combustion engines with spark arresters, and providing fire suppression equipment and emergency notification numbers at each construction site

5 DECOMMISSIONING

The proposed transmission line would have a projected operational life of at least 50 years or longer. At the end of the useful life of the Project and if the facility were no longer required, the transmission line would be removed from service. Prior to the decommissioning and 2 years prior to such event, the Company would notify the authorizing agency of their intent to terminate right-of-way and would develop a reclamation plan. The reclamation plan would be reviewed and approved by the agencies and a reclamation bond would be posted and any required NEPA completed prior to commencing any abandonment actions. At such time, conductors, insulators, and hardware would be dismantled and removed from the right-of-way, according to the agency-approved plan. Structures would be removed and foundations removed to below ground surface.

Following removal of the transmission-line structures and equipment from the right-of-way, any areas disturbed during line dismantling would be restored and rehabilitated in accordance with the approved reclamation plan. In the same way, if a substation is no longer required, the substation structures and equipment would be dismantled and removed from the site. The station structures would be disassembled and either re-used at another station or sold for scrap. Major equipment such as breakers, transformers, and reactors would be removed, refurbished, and stored for use at another facility. Foundations would be either abandoned in-place or cut off below ground level and buried according to the approved reclamation plan.

The Company describes roads necessary for the operation and maintenance of transmission lines as access roads, with the sole purpose of providing maintenance crews access to the transmission lines. These roads would not exist if the transmission lines did not exist. In contrast, access roads serve a broader purpose, such as contributing to the federal, county, or state road systems. Access roads provide direct or indirect access to the transmission lines, but that access is not their primary purpose. The Company is responsible for the reclamation of access roads following abandonment and in accordance with the land-management agency's or landowner's direction, but is not responsible for reclamation of access roads unless mutually agreed upon by the Company and the landowner or required by the land-management agency. Access roads would be decommissioned following removal of the structures and lines, and may be decommissioned while the lines are in-service if they are determined to be no longer needed.

The Company may decommission access roads by (1) entering into an agreement with the BLM or USFS under which the agencies restore the road located on federal lands and is reimbursed for costs by the Company or (2) the Company or its contractor implement restoration measures as described below.

When an access road has been identified as no longer needed, the road would be reclaimed and seeded as soon as possible during the optimal seeding season. In some cases, reseeded may not be necessary, given the existing amount of soil compaction and vegetation currently in place. Where required by the land-management agency, compacted areas would be ripped and appropriate sediment control measures would be implemented.

Restoration and reclamation of the Project right-of-way would be in accordance with Section 3.2.8 – Site Reclamation and in accordance with the Project Construction POD.

REFERENCES

Institute of Electrical and Electronics Engineers (IEEE). 2007. National Electric Safety Code. IEEE Standards Association. New York, New York.

PacifiCorp. 2007. Transmission and Distribution Vegetation Management Program: Specification Manual. PacifiCorp System Forester. Salt Lake City, Utah. June 1.

Attachment A – Access Road Standards

Avian-Safe Transmission Structures

A. Scope

This standard provides information regarding the protection of birds of prey (raptors) and other large birds from electrocution resulting from contact with overhead transmission power lines.

B. Background and Regulations

Raptors and other large birds can get electrocuted from coming into contact with overhead power lines. In addition to bird mortalities, such electrocutions can cause interruption of power, resulting in reduced reliability and restoration costs. Various government agencies, conservation groups and the general public demand both higher service reliability and better protection of avian populations and their habitats. PacifiCorp's Bird Management Program and Avian Protection Plans use proactive, reactive and preventative measures to reduce bird mortalities and bird-related outages. Additional information can be found on the Environmental Services intranet website.

The following federal laws in the U.S. protect almost all avian species:

- The Migratory Bird Treaty Act (MBTA) of 1918
- The Bald and Golden Eagle Protection Act of 1940
- The Endangered Species Act (ESA) of 1973

The MBTA protects over 800 species of native North American migratory birds, with the other two acts placing further emphasis on preservation of eagles and endangered species of birds. Failure to comply with these laws can result in substantial fines and criminal prosecution. Therefore transmission system owners must actively attempt to prevent avian electrocutions.

C. Avian Electrocutions

Birds can be electrocuted by simultaneously contacting two energized conductors or an energized conductor and grounded structures, conductors, hardware, or equipment. Electrocutions may occur when the bird is landing, perching or taking off. The electrical design factor most crucial to avian electrocutions on structures is the physical separation between energized and/or grounded components that can be bridged by birds. As a general rule electrocutions occur on structures with the following:

1. Phase conductors separated by less than the wrist-to-wrist distance or height of a bird. See Figure 1.
2. Grounded hardware (e.g. grounded wires, bolts, etc.) separated from and energized phase conductor by less than the wrist-to-wrist distance or height of a bird.

Dry feathers provide insulation, so birds must typically contact electrical equipment with fleshy parts that are conductive for electrocution to occur. Fleshy parts include the feet, mouth bill and the wrists from which the primary feathers originate. For a large golden eagle with a 90" wingspan, the distance from the fleshy tip of one wrist to the tip of the other can measure up to 42 inches; the height (head to foot) of an eagle can reach up to 28 inches.

Transmission Construction Standard

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Engineer (A. Shkuratkov): *A.S.*

Sr. Engineer (C. Wright): *CLW*

Avian-Safe Transmission Structures



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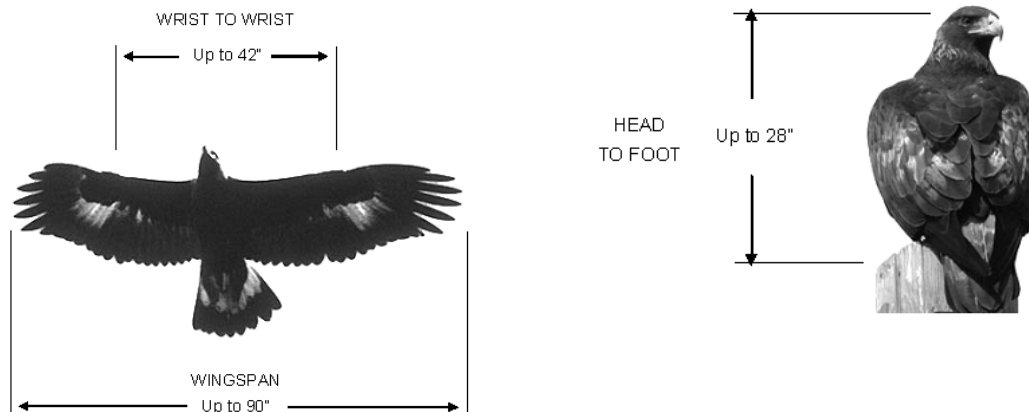


Figure 1 — Typical eagle dimensions

D. Avian-Safe Symbol

“Avian-Safe” structures have been designed to provide adequate distances between energized and/or grounded components in order to allow birds to perch without risk of electrocution. Avian-safe overhead transmission construction standards are marked at the top of the first page with the symbol shown in Figure 2.



Figure 2 — Avian-safe symbol

E. Avian Protection

Transmission structures generally have sufficient separation between phases, but there are many shielded structures that do not have adequate separation between energized and grounded components. Installing avian protection devices, such as covers, can greatly reduce bird fatalities. This method of protection is preferred for existing structures because of lesser cost of retrofitting and no line outage.

For new construction, the preferred method of protection is to provide adequate horizontal and vertical separation between all energized and grounded components of the structure, and/or between phases, such that large birds cannot bridge that distance.

The industry standard for avian protection on power lines, which is also used by PacifiCorp, is **60 inches of horizontal separation** and **40 inches of vertical separation**.

These clearances shall apply to all grounded structures such as concrete, steel, or grounded wood poles, or where phase-to-phase distance is inadequate. The separations are intended to allow sufficient clearance for an eagle. Applying this standard will



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also protect smaller birds, such as ospreys, hawks, owls, wading birds and song birds. Several transmission structure types with minimum distances labeled are shown in Figure 3 and Figure 4.

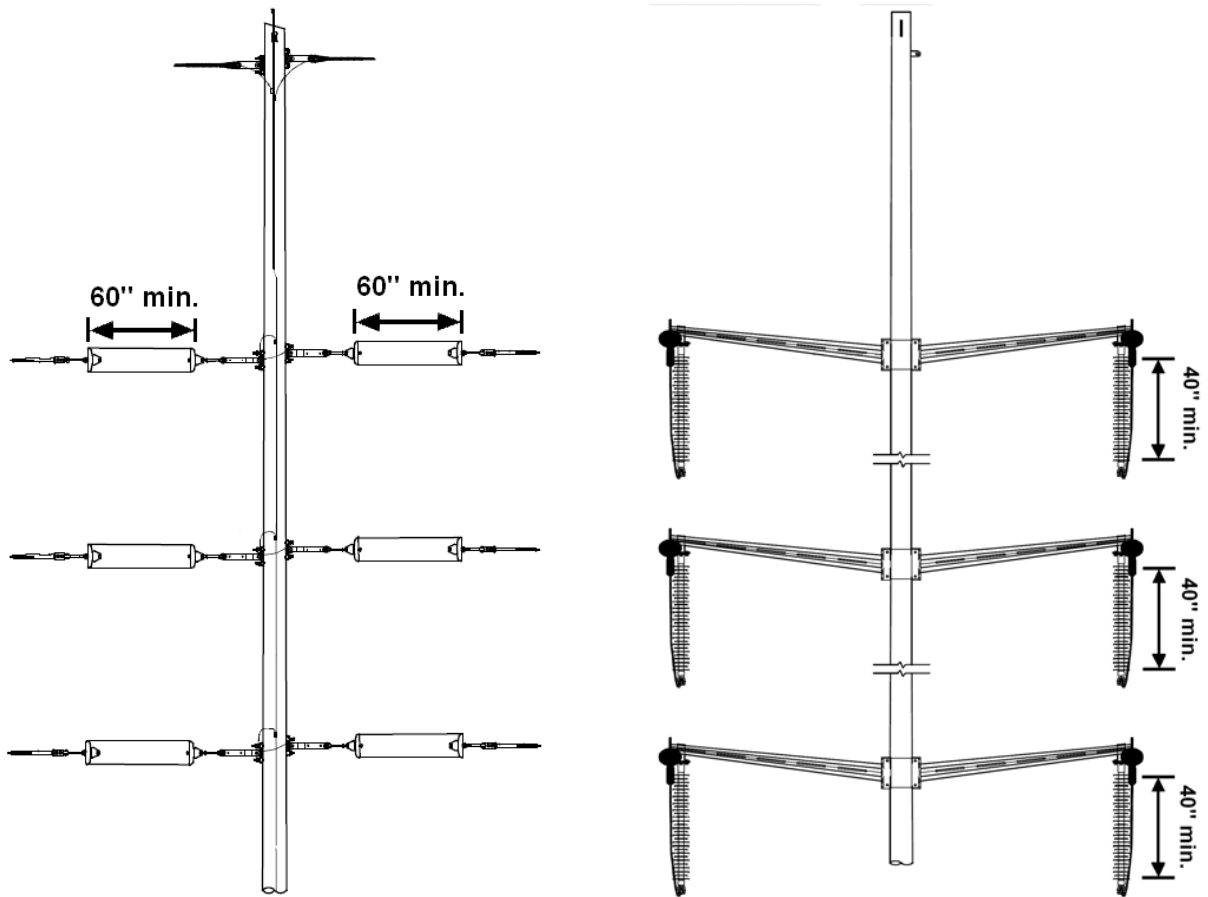


Figure 3 — Deadend transmission structures showing minimum required distances

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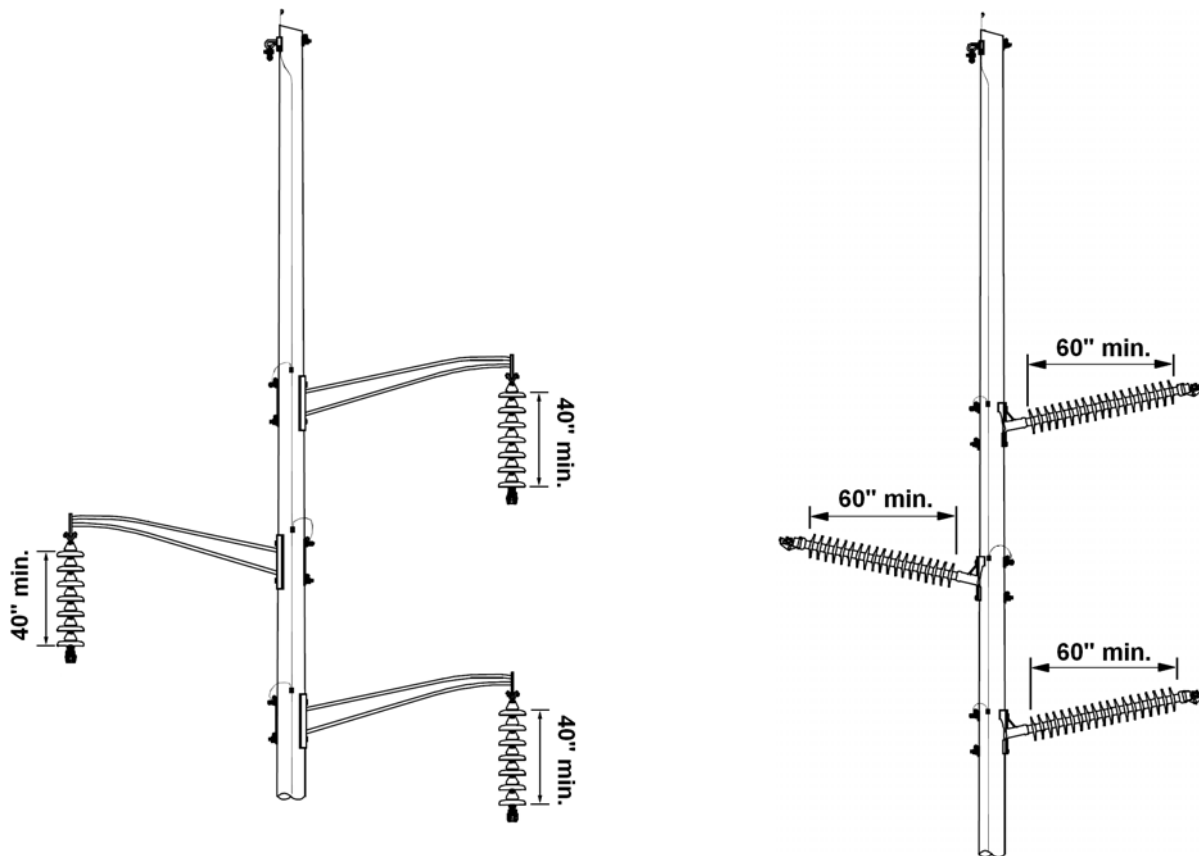


Figure 4 — Tangent transmission structures showing minimum required distances

The required minimum distances between energized conductors and grounded equipment apply to grounded structures only. There are two main types of transmission poles which fall under this category:

- Steel or concrete poles, which are always grounded.
- *Shielded* wood poles, which have a grounded wire running the length of the pole with all hardware bonded.

Unshielded wood poles do not have a grounding wire running the length of the pole, and birds do not get electrocuted by contacting the pole and energized conductor simultaneously.

The minimum lengths discussed in this standard are intended to guide design and installation of transmission structures from 46/69 kV through 138 kV. Transmission structures for 161 kV and above have sufficiently long insulators to meet all the minimum clearance requirements described above.



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F. Reporting Mortalities and Problem Nests

Dead birds of protected species found on, below or near PacifiCorp distribution and transmission facilities or substations must be reported using PacifiCorp's Bird Mortality Tracking System (BMTS). All required data for entry into the BMTS should be collected by field personnel that discovered the mortality.

All birds, excluding eagles and threatened or endangered species, should be buried on site after data is collected, unless the carcass has a leg band, radio transmitter, neck collar or other special marker. If it is not possible to bury or dispose of the carcass, leave it on site and notify the local manager. A mortality record must be entered into the BMTS and appropriate remedial action taken, as described below.

The BMTS website may be found here:

PacifiCorp Intranet Home Page

→ *Environment*

→ *Environmental Resources*

→ *PP or RMP Environmental Support*

→ *Avian*

→ *Bird Mortality/Problem Nest Incident Reporting*

Click "Add Mortality" to review all the information required in reporting a bird mortality.

Eagle or other endangered/threatened bird mortalities must be reported to Environmental Services immediately upon discovery. Environmental Services will notify USFWS of dead eagles, which will be retrieved by the agency. File a report using the BMTS as described above, including detailed directions to the site for retrieval of the carcass. The local manager must be notified immediately regarding any eagle, endangered/threatened species or marked bird mortalities. Endangered and threatened species that may be seen at PacifiCorp's facilities include California condor, bald eagle, whooping crane and spotted owl.

Although electrocution of birds nesting on power line equipment is relatively rare, nests may cause operational problems. Problem nests may also be reported using the BMTS Nests which do not interfere with power operations should be left in place. In most cases, a permit is required to remove or relocate a nest. If a nest is causing immediate danger of fire, safety risk to crew, risk of bird electrocution or threat to human life or property, then PacifiCorp crews may take immediate action prior to receiving a permit. In this case, Environmental Services must be notified immediately to report "imminent danger" action taken.

Training presentation on bird protection are conducted by Environmental Services for field personnel. Training materials are also available on the Environment intranet website. Environmental Services staff will assist with site-specific prescriptions as necessary. Each district is responsible for ensuring that all employees likely to find dead birds or nests are familiar with the proper procedures for reporting and documentation, and other aspects of PacifiCorp's Bird Management Program.

The BMTS is a searchable database of bird mortalities and problem nests. To avoid entering redundant mortalities or nests, search for past reported incidents and confirm that it has not already been reported.

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G. New Construction and Maintenance

All new or rebuilt power lines and poles shall be built to avian-safe standards.

Poles where a protected bird was killed must be retrofitted to prevent additional electrocutions. Retrofitting could include the following:

- Applying covers
- Installing longer insulators
- Reframing or replacing the structure

For more information on all of the avian-safe topics discussed here, refer to PacifiCorp's Bird Management Program Guidelines and other related documents on the Avian Program site:

PacifiCorp Intranet Home Page

→ *Environment*

→ *Environmental Resources*

→ *PP or RMP Environmental Support*

→ *Avian*

→ *Bird Management Guidance Documents*

→ *Bird Management Policies*

→ *Raptor Safe Construction Standards*



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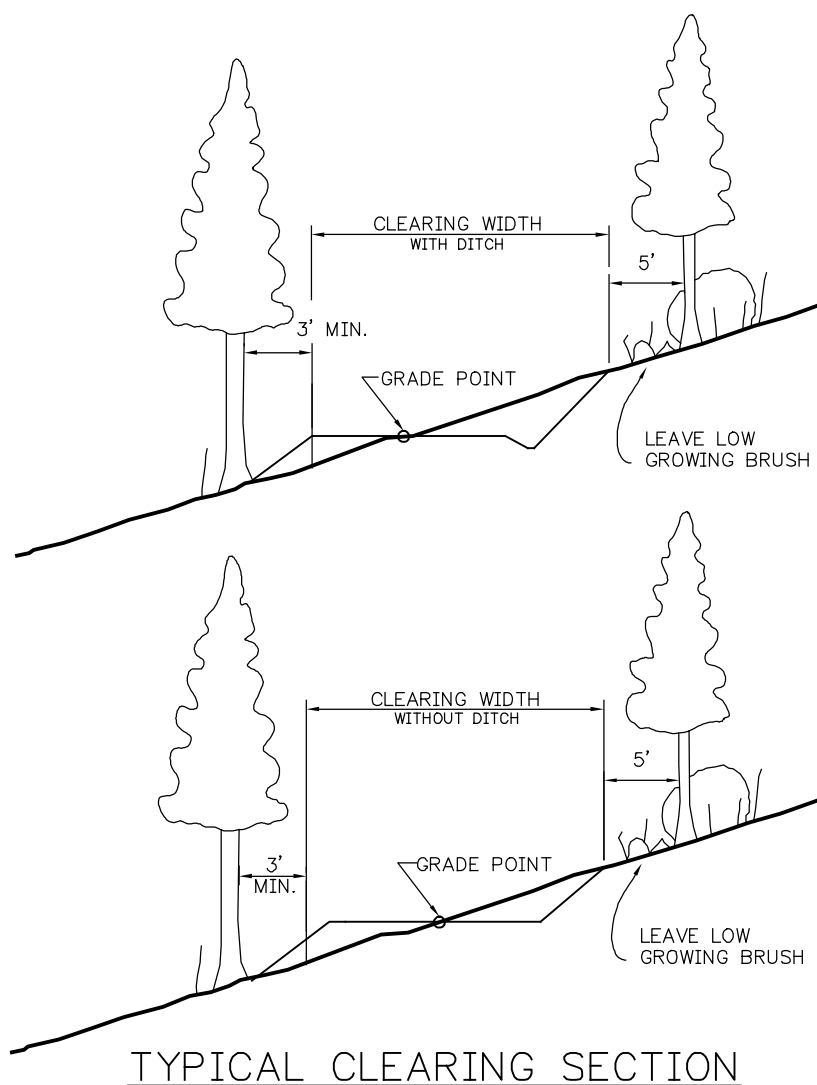
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Roads—Clearing for Installation and Maintenance of Roads

A. Scope

This standard supplies information about clearing necessary for installation of transmission line access and rights-of-way roads. Clearing width for the construction of new roads or maintenance of existing roads shall be three (3) feet beyond the edge of the roadway on level ground. On hillside cuts or fills, the clearing shall be sufficient width to install the cut or fill without interference. (See figure 1).



TYPICAL CLEARING SECTION

Figure 1—Road Clearing Cross Section

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Table 1 — Clearing Width

Side Slope (%)	Cut Slope	Clearing Width (ft)	Clearing Width (ft)	Clearing Width For Turnouts (ft)	
		w/o Ditch	w/ Ditch	w/o Ditch	w/ Ditch
0		24	27	30	33
10	1.5 : 1	26	30	32	35
20	1.5 : 1	27	31	33	37
30	1.5 : 1	29	32	36	40
40	1.5 : 1	31	35	39	43
50	1.5 : 1	34	39	44	49
60	3/4 : 1±	37	44	48	55
70	3/4 : 1±	45	52	55	62
80	1/2 : 1±	37	43	47	53

Notes:

1. See specifications for additional information on clearing and grubbing.
2. ± full bench
3. For clearing purpose only.

Where it is necessary to fell trees in streamside areas, fell trees away from streams, retaining all non-hazardous vegetation. Do not skid trees in, through, or across streams.

All operations on federal government property shall comply with applicable statutes and regulations, including stipulations contained in right-of-way permits.

No trees shall be cut or removed before they are marked for removal.



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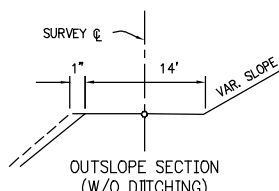
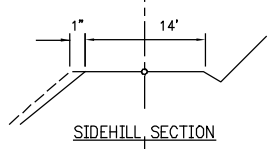
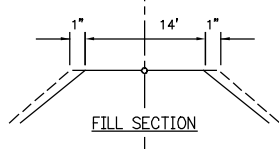
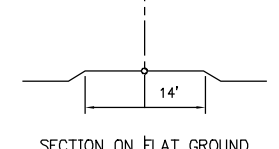
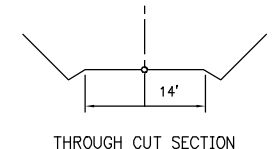
Roads—Construction

A. Scope

This standard provides information about constructing transmission line access. All road construction/improvements, fords, structure/equipment landings, and lay-down yards shall be held to a minimum. On level terrain, road construction may only require back-dragging a blade to remove brush to facilitate construction. In undulating or mountainous terrain the following standards shall apply.

B. Index

The index below provides a quick reference to detailed figures contained in this standard for road construction with varying slopes and conditions.

Referenced Road Cross Section	ACCESS ROAD SECTION
Figure 2	 OUTSLOPE SECTION (W/O DITCHING)
Figure 3 Figure 4 Figure 5	 SIDEHILL SECTION
Figure 2	 FILL SECTION
Figure 2	 SECTION ON FLAT GROUND
Figure 2	 THROUGH CUT SECTION

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C. Planning

Before construction can take place, the road system must be planned and located properly. Poor planning or road location is associated with the following most common causes of road failure (Furniss et al. 1991):

- Improper placement and construction of road fills.
- Insufficient culvert sizes.
- Very steep road grades.
- Improper placement or sidecast of excess materials.
- Removal of slope support by undercutting.
- Altering drainage by interception and concentration of surface and subsurface flows.

A plan showing existing and new road locations shall be developed and shall be shown on the company's access road charts, plan maps, and transportation plan map. Road locations shall be marked on the ground by survey stakes and blue-and-white, striped flagging. GPS coordinates shall be obtained to define the road center-line. These coordinates shall be used to create the transportation plan map. Road information shall also be placed on transmission line plan maps.

In the event of conflict between the drawings and the staked locations, the latter shall take precedence and transportation plan maps and the transmission line plan maps shall be revised accordingly. Any culverts and gates listed in access road charts are required. Fords, drainage improvements, rip-rap fills and crushed rock requirements listed in the access road charts are anticipated; however, requirements will be determined based on actual site conditions encountered. If changes are made in the field, the maps shall be revised to show these changes.

Because roads are long-term features, their location must be carefully chosen to provide safe access, avoid long-term maintenance problems, reduce potential for degrading water quality, and minimize costs over the short and long term. For more information see the references in Section H.

D. Road Construction

Roads shall be constructed in a manner that will support equipment for construction of the transmission line and to provide access roads for line inspection and maintenance equipment after the line has been constructed.

All construction access roads on federally managed public lands are subject to approval prior to construction. Other federal, state, and local landowners may require approvals before road construction commences on their property. Where side slopes exceed 60 percent, a full bench cut will be required. No side-casting of material will be allowed in these areas; end-haul of material will be required to a designated location approved by the federal agency or other property owner. Close coordination with the federal agency will be required.

The detail drawings provided in this standard for completing cuts and fills, providing drainage, and installing culverts are furnished as guidelines for the road construction. Actual road construction cut slopes, fill slopes, drainage requirements, rip-rap, and



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crushed rock needs will be determined during construction based on site conditions. Cut and fill quantities shall balance when possible, reducing the material removed or brought in for road completion.

During road construction, consideration shall be given to restoration required after construction completion, including re-vegetation, rock cover, and other drainage and erosion control factors. Clearing and grading shall be minimized to reduce the restoration requirements for disturbed areas. The visual impact of roads on the surrounding areas shall be considered at all times during construction.

Crushed rock shall be sound, hard, durable, angular, or sub-angular rock, suitable for road base courses. Crushed rock shall be well graded 2" to 1/4" size (3" to minus-size skip-graded is a minimum acceptable substitute).

Rip Rap shall be sound, hard, durable, rock ranging in size from 2" to 8" as specified on drawings and as required by conditions.

Any improvements made, including spur roads, fords, bridges, equipment landings and lay-down areas, shall be held to a minimum. Following completion of the work, the removal of these improvements shall be at the discretion of company or its representative.

Roads shall be sufficiently wide, but not less than 14' in width. The construction shall provide bench cuts, grading, filling, compaction, and ditches necessary to accommodate heavy construction equipment and other heavily loaded vehicles. Roads shall be installed in accordance with the figures in this standard.

All roads shall be constructed with a smooth, uniform surface and shall be outsloped where practical to provide drainage and minimum erosion. Avoid outsloped roads where they will direct runoff onto erodible fill, embankments, or where they would cause off-camber curves. Where outsloping is not practical, sufficient water dips, water bars, or ditching, shall be installed as shown in the Section E of this standard. See standards TA 503, *Roads—Water Bars and Water Dips* and TA 504, *Roads—Culvert Installation* for further detail on proper drainage.

Outsloping a road means building the road surface so that it is tilted outward 2-3 percent so water can run off the road surface (see Figure 1). Outsloping works well under the right conditions. The following conditions are favorable for use of outsloped roads with no ditch:

- Short back slopes.
- Terrain slope less than 20 percent.
- Road grades steeper than 3 percent.
- Seasonal road use.
- Light traffic.
- Fast re-vegetation of cut and fill slopes.

Outslopes become a problem if roads are not maintained when ruts begin to form. The ruts will then act as channels.

The following conditions are unfavorable for outsloping:

- Long back slopes.

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- Terrain steeper than 20 percent.
- Steep, continuous road grade.
- Where ruts occur and allow water to concentrate and run along the road.
- Where winter hauling is required.

To minimize rutting and erosion of the right-of-way, road construction shall be completed during predominantly dry conditions. Fills, which will essentially consist of native soils, shall not be made when the moisture content of the soils will not permit adequate compaction.

As a minimum level of compaction, common fill shall be placed in 12"-thick, loose lifts and each lift compacted by walking or tracking in with a heavy dozer or rubber-tired (pneumatic) equipment. Each lift shall be compacted by at least four passes with the equipment.

In areas of dense vegetation, the surface organic material shall be stripped from the ground within the roadway and cut and fill areas. Stripping to a maximum depth of 6" will be adequate unless otherwise directed by the company or its representative. Stripped and disturbed areas shall be compacted as specified above or as shown in the drawings or access road charts.

Personnel constructing the access road system shall be aware of the definition of a wetland such that potential wetlands may be identified before work is begun. In some cases where wetlands have been identified, road construction personnel shall comply with requirements as directed by the company or its representative.

Ditches, installed culverts, and/or installed surface drains to drain wet areas resulting from springs, seeps, or poor surface drainage may be required to construct the road. Drainage ditches shall be shallow, not to exceed 18" in depth. The ditch bottom shall have a width of approximately 1' and side slopes shall not exceed 1.5 to 1 (see Figure 5).

All earthwork and grading, cut and fill slopes, and other disturbed areas shall be re-vegetated with seed. Unless otherwise specified, the seed mix shall consist of 45 percent rye grass, 45 percent orchard or fescue grass, and 10 percent clover. The seed shall be applied at a minimum of 60 pounds per acre. At locations where the ground slope is greater than 10 percent, the seeds shall be covered with straw- or wood-fiber mulch applied at a rate of one ton of mulch per acre. The seed shall be spread in early fall when weather permits.

All phases of operation, including the construction of truck and tractor roads, shall be conducted to minimize as much as practical the damage to the soil and to prevent gullies and creation of other conditions conducive to soil erosion. Repair of all erosion damage shall be accomplished as soon as it occurs to prevent further loss of material into existing drainages. Cut slopes shall be stabilized. Care shall be taken to avoid creation of wet land conditions.

Crew movement on the right-of-way, including access routes, shall be limited so as to minimize damage to land or property. Crews shall endeavor to avoid marring the lands. Ruts and scars shall be obliterated, damage to ditches, terraces, roads and other features of the land shall be corrected, and the disturbed land beyond the access roads and structure landings shall be restored, as nearly as practical, to its original condition before final acceptance of the work.



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Erosion control measures shall be installed to minimize the transport of eroded sediments to streams and other waterways. Erosion control measures may include, but are not necessarily limited to, straw bales and silt fences.

E. Road Cross Sections

This section provides road cross sections, including required dimensions, cleared right-of-way width, and other information. See general road construction notes in Section G and references in Section H.

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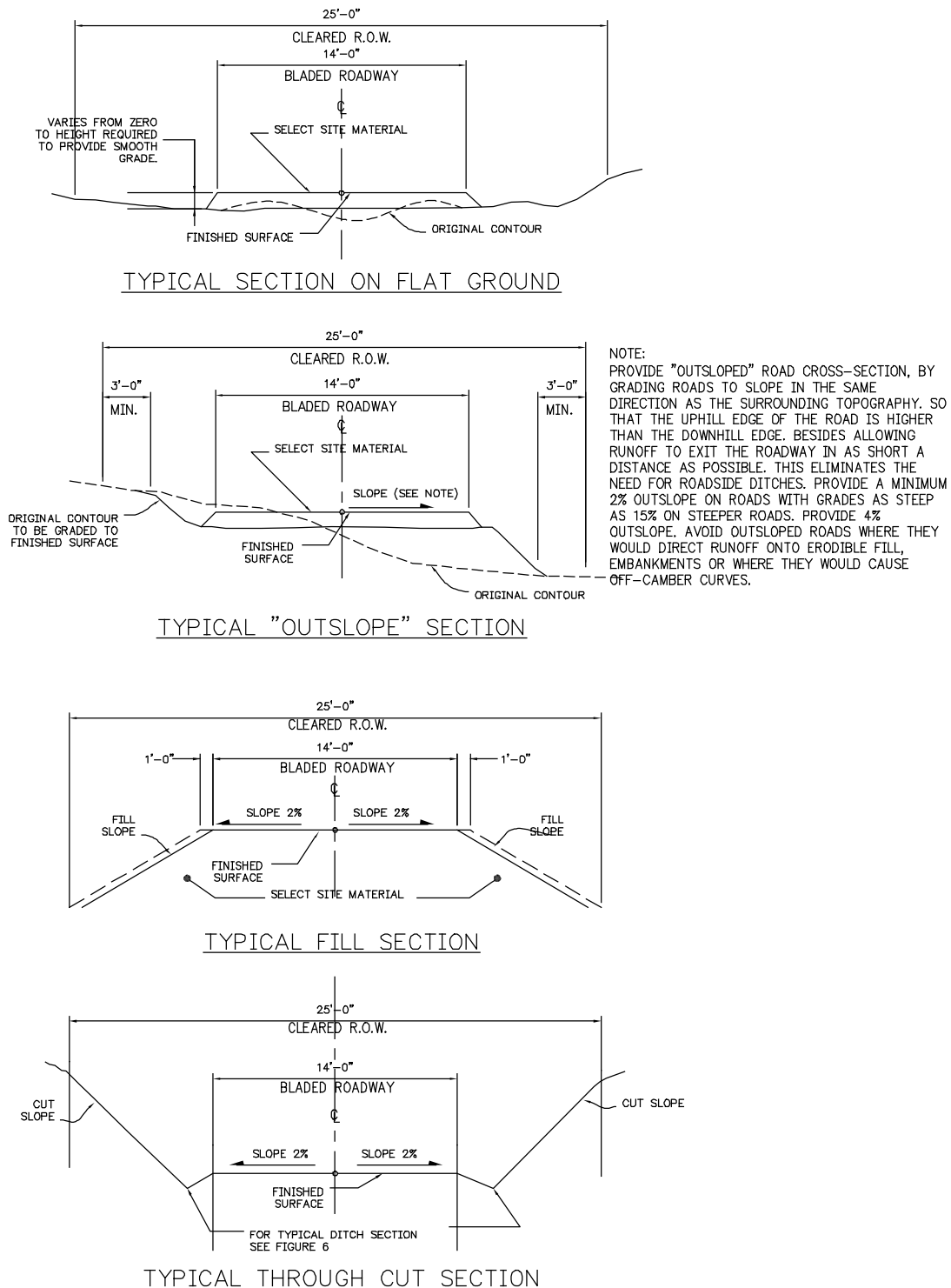


Figure 1—Typical Road Sections for Different Terrains

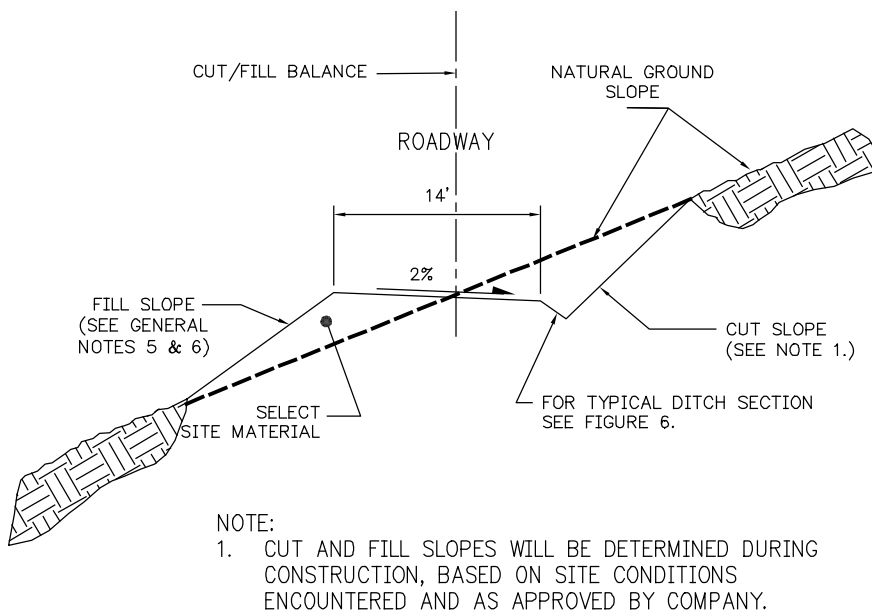


**Figure 2—Typical Cut and Fill Insloped Road Section
for Natural Side Slopes Less Than 30 Percent (15°)**

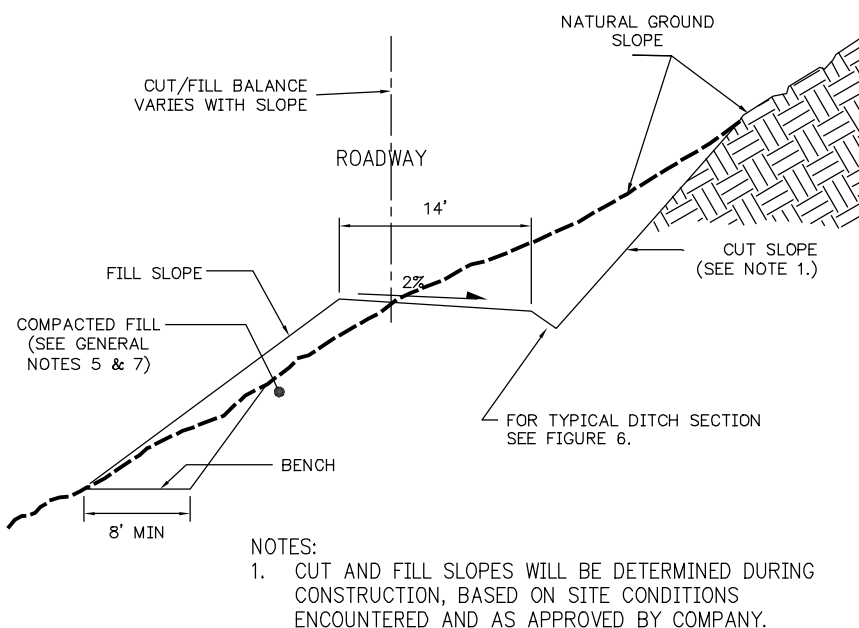


**Figure 3—Typical Cut and Fill Insloped Road Section
for Natural Side Slopes Greater Than 30 Percent (15°) and Less Than 60 Percent (30°)**

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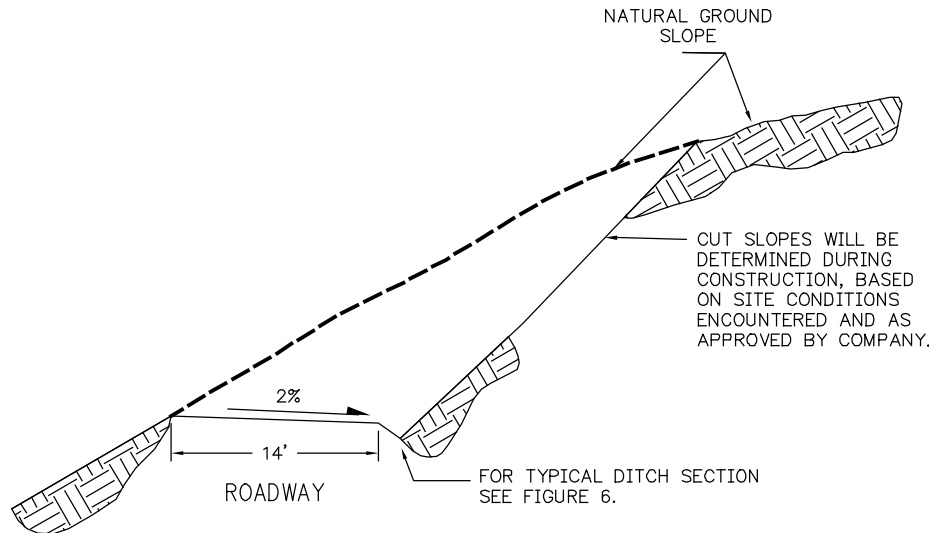


Figure 4—Typical Cut and Fill Section
for Natural Side Slopes Greater than 60 Percent (30°)

F. Typical Ditch Section

Typical ditch construction is depicted in Figure 6. Many of the road cross sections shown above use this ditch construction.

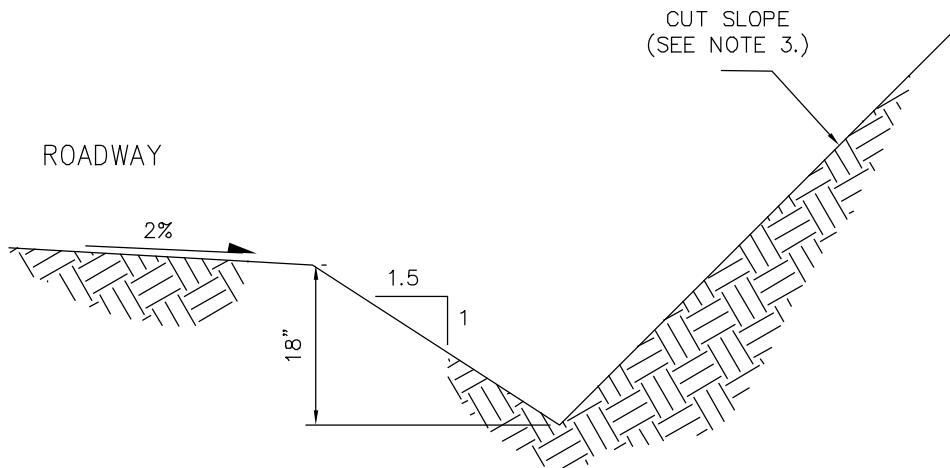


Figure 5—Ditch Section

Notes:

1. Slope the ditch so that it will drain; ditch shall have a minimum slope of 1 percent and not to exceed 3 percent.
2. Remove all soil, rock, and other material loosened by grading from ditch.
3. Cut slopes will be determined during construction based on site conditions and as approved by the company representative.

G. General Road Construction Notes

1. Roads shall follow natural contours as much as practical.
2. Maximum grade for roads shall be 10 percent. Grades up to 20 percent will be allowed for a distance of 1000 feet where unavoidable and approved by the company.
3. Radius of curves shall be 200 feet, with a minimum of 80 feet when approved by company. When curves are less than 200 feet, roadbed shall be widened as shown in Table 2.
4. Cut and fill slopes will be determined during construction based on site conditions encountered and as approved by the company.
5. Unless specified otherwise by the company, fill material shall consist of site material excavated from RG-1 cuts. Fill material shall have a maximum particle size of 12".
6. Fills placed on side slopes of 30 percent or less shall be placed in nominal 9" lifts and compacted by walking in with at least four passes of earthwork equipment.
7. Fills placed on side slopes greater than 30 percent shall be placed in nominal 12"-thick lifts and compacted to at least 90 percent of the maximum dry density as determined by the ASTM D 696 method of compaction.
8. Allow 1' additional road width on fill slopes for sloughing. When fills are over 6' high at shoulder, allow 2' additional road width.
9. Road construction across wetland areas may require placement of fragmented 6" minus rock. Rock shall be placed in 8"-thick lifts and compacted by a heavy dozer or vibratory roller until well keyed. RB-(1) rock will be provided and installed by the contractor. Proper construction shall be use in wetlands so conditions as shown in Figure 7 do not develop.
10. Geotextile fabric material shall consist of MIRAF1212 OHP or equivalent, as approved by the company.



Figure 6—Poor Road Construction in Wetland Area

Table 2—Road Width for Different Road Curves

Curve Radius (feet)	Roadbed Width (feet)
200 or >	14
150 to 200	16
100 to 150	18
80 to 100	20

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H. References

1. *Handbook for Forest and Ranch Roads*, William E. Weaver, PHD. and Danny K. Hagans, 1994.
2. *A Landowner's Guide to Building Forest Access Roads*, United States Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry, July 1998.



Roads—Water Bars and Water Dips

A. Scope

This standard describes drainage methods, including water bars, water dips, ditches, and outsloping, which can be used where intermittent or permanent streams cross roadways. Depending on the method used, drainage structures should be installed during or after basic road construction (see TA 501, *Roads—Construction*). For information on ditches and culverts see TA 504, *Roads—Culvert Installation*.

On level terrain, road construction may only require back-dragging a blade to remove brush to facilitate construction. Water bars and dips may not be necessary.

In undulating or mountainous terrain, water bars or water dips shall be used to control erosion.

The BLM or US Forest Service may require special designs for road design.

On privately owned land, both PacifiCorp and the property owner shall approve a plan to best control erosion on rights-of-way roads.



Figure 1—A water bar effectively intercepts the surface water and diverts it from the road

B. Water Bars

Water bars are narrow structures which can be constructed at various depths. Deep bars are generally used on roads closed to vehicle traffic. Figure 1 shows a typical shallow water bar constructed across a road.

Water bars can be constructed with hand tools, but bulldozers are most commonly used. It is best to start at the end of the road and work outward so the bars are not damaged with frequent crossing by heavy machinery.

Table 1—Distance Required Between Water Bars

Road grade (%)	Distance (feet)
2	250
5	135
10	80
15	60
20	45
25	40
30	35

Source: Kochenderfer 1970, p. 28

Water bars should be installed at an approximate 30° angle downslope. Figure 2 shows dimensions for construction of water bars and water dips with and without drainage

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ditches to be used on access and right-of-way roads. The outflow end of the water bar should prevent water from accumulating and should not flow directly into a stream. This will allow sediment to settle out of the water, preventing erosion. As a supplement to water bars on closed roads, logging slash can be lopped and scattered, grass can be planted, or both. Table 1 shows recommended spacing between water bars for various road grades.

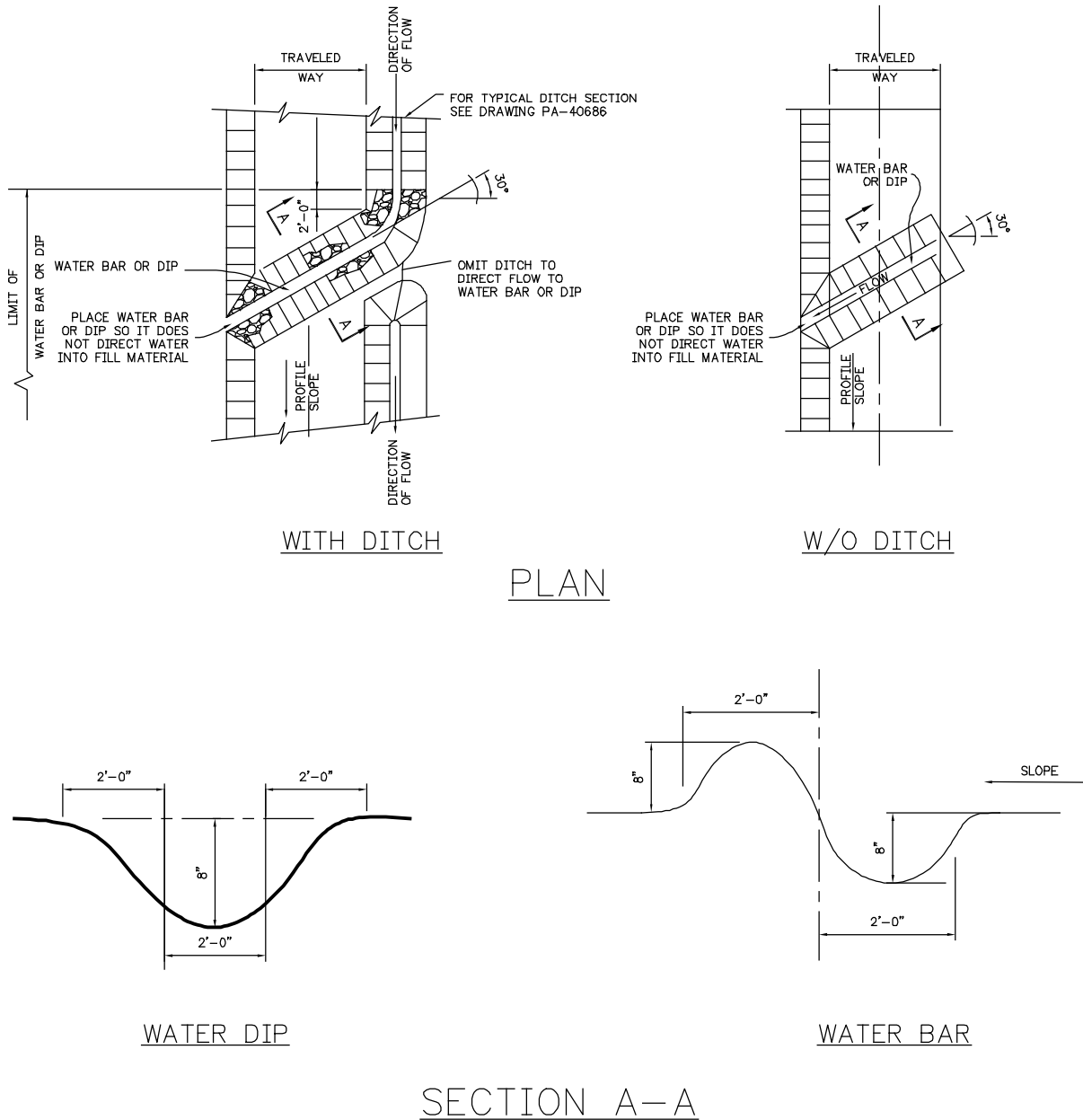


Figure 2—Water Bar and Dip Construction Plan and Profile



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Roads—Water Bars and Water Dips

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C. Broad-Based Drainage Dips

Broad-based drainage dips are easily maintained and do not increase wear on vehicles or reduce hauling speed when properly installed. These dips shall not be used on roads graded in excess of 10 percent (see Figure 3).

Table 2 lists the spacing distances of broad-based dips, as computed with the formula shown in Figure 3.

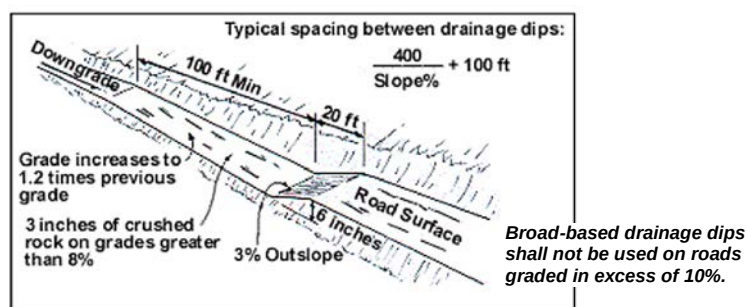


Figure 3—Typical Spacing Between Drainage Dips

Table 2—Minimum Distance Needed Between Drainage Dips

Road grade (%)	Distance (feet)
2 - 4	300 - 200
5 - 7	180 - 160
8 - 10	150 - 140

Source: Kochenderfer 1970, pg.19, 25

As with a water bar, care shall be taken to ensure adequate drainage at the outflow of a dip. Broad-based drainage dips shall never be designed to discharge directly into a stream. The discharge area shall be protected with stone, grass, sod, heavy litter cover, brush, logs, or other natural material which will reduce the velocity of the water. Natural litter may be adequate in many cases if the terrain is not too steep.

Close attention shall be paid to construction of broad-based drainage dips, as they are often made too small. Figure 3 shows minimum dimensions. Dips shall be armored with crushed rock or gravel.

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Figure 4 shows a practical example of how a broad-based drainage dip can be used. A drainage dip is effective in controlling water on the road and does not significantly slow the speed of vehicles. The local drainage shall dictate how often these dips shall be used.



Figure 4—Broad-Based Drainage Dip



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Roads—Culvert Installation

A. Scope

This standard provides information about the construction of surface drainage and the installation of culverts. It is impossible to over-emphasize the importance of drainage in maintaining stable roads and protecting water quality. Roads should be designed and constructed to cause minimal disruption of natural drainage patterns. Provisions for two components of road drainage should be included in every road project: 1) road-surface drainage (including drainage which *originates* from the cutbank, road surface, and fill-slope), and 2) hill-slope drainage (including drainage from large springs, gullies, and streams which *cross* the road alignment).

B. Determining Culvert Diameter

Use pipe no smaller than 24" in diameter. A drainage table provides help in determining the proper size culvert (see Table 1 and Table 2). The following example illustrates how to choose pipe size (Table 1) using the drainage table (Table 2). To use this method, you will need information on slope, soils, and cover.

Example: The area to be drained is 70 acres on steep slopes with heavy soils and moderate cover. In Table 2 under C opposite 70, find area required: 10.3 square feet. Under the area table for round pipe (Table 1), the pipe size should fall between 42" and 48". Use 42" pipe with an area of 9.6 square feet. If a wood or other type of box culvert is planned, one 3' by 3.5' pipe would furnish the required area.

Table 1—Size of Round Pipe Needed for Area of Waterway

Area (square feet)	Pipe diameter (inches)
1.25	24
1.80	24
3.10	24
4.90	30
7.10	36
9.60	42
12.60	48
15.90	54
19.60	60
23.80	66
28.30	72
33.20	78
38.50	84
44.20	90

Source: Figure 45, Haussman and Pruett
1978, p. 36

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Table 2—Drainage Table Based on Talbot's Formula for Rainfall
1-1/4" per Hour

Area required for waterway								
Acres	Impervious 100% runoff †C=1.00	Steep slopes Heavy soils Moderate cover C=0.80 C=0.70		Moderate slopes Heavy to light soils Dense cover C=0.60 C=0.50		Gentle slopes Agricultural soil & cover C=0.40 C=0.30		Flatland Previous soils C=0.20
Square Feet								
2	0.5	0.4	0.4	0.3				
4	0.9	0.7	0.6	0.5				
6	1.2	1.0	0.8	0.7	0.6	0.5		
8	1.5	1.2	1.0	0.9	0.7	0.6		
10	1.7	1.4	1.2	1.0	0.9	0.7	0.3	
20	2.9	2.3	2.0	1.8	1.5	1.2	0.5	
30	4.0	3.2	2.7	2.4	2.0	1.6	0.5	0.3
40	4.9	3.9	3.4	3.0	2.5	2.0	0.9	0.4
50	5.8	4.7	4.0	3.5	2.9	2.3	1.2	0.6
60	6.7	5.4	4.6	4.0	3.4	2.7	1.5	0.8
70	7.5	6.0	5.2	4.5	3.8	3.0	1.8	1.0
80	8.3	6.7	5.8	5.0	4.2	3.3	2.0	1.2
90	9.1	7.3	6.3	5.5	4.6	3.6	2.3	1.4
100	9.9	7.9	6.8	5.9	4.9	3.9	2.5	1.5
150	13.5	10.6	9.3	8.0	6.7	5.4	2.7	1.7
200	16.6	13.4	11.5	10.0	8.4	6.7	2.9	1.8
250	19.8	15.8	13.6	11.9	9.9	7.9	4.0	2.0
300	22.9	18.1	15.5	13.6	13.5	9.0	5.0	2.7
350	25.5	20.3	17.5	15.3	12.7	10.1	5.9	3.3
400	28.0	22.5	19.5	17.0	14.0	11.1	6.8	4.0
450	30.9	24.9	21.0	18.5	15.3	12.1	7.5	5.1
500	33.4	26.4	23.0	20.0	16.6	13.3	8.4	5.6
600	38.5	30.8	26.3	23.0	19.0	15.2	9.0	6.2
700	43.0	34.2	29.8	26.0	21.5	17.0	9.9	6.6
800	48.0	38.1	32.9	28.5	23.8	19.0	11.4	7.7
900	52.0	41.5	35.9	31.1	26.0	20.8	12.9	8.6
1000	56.5	45.0	38.9	34.0	28.3	22.5	14.3	9.5

* See Table 1 for size of pipe needed.

† C is the constant factor based on a combination of how much water the soil can hold, slope, and cover. C = .70 is adequate for most conditions prevailing in the Northeast. C = 1.00 represents complete runoff of precipitation (e.g., rock surfaces).



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Table 3 provides a simplified method for determining culvert size. To use this table, determine the size of the drainage area (in acres) above the stream crossing as well as the expected life of the culvert. A private consultant may provide assistance determining the size of a culvert. Make sure they do not size the culverts for a 50- or 100-year storm, unless that is what is required. For low-traffic or temporary roads, a flood frequency of 20 years can be used.

Table 3—Culvert Sizes by Drainage Area

Area (acres)	Recurrence interval (years)		
	10	20	50
Culvert diameter (inches)			
10	24	24	18
20	24	24	20
30	24	24	24
40	24	24	26
50	24	24	28
60	24	24	28
70	24	26	30
80	24	26	30
90	24	28	32
100	26	28	34
125	28	30	36
150	28	32	38
175	30	34	40
200	32	36	42

Source: Table 3, Helvey and Kochenderfer 1988, p. 125

C. Determining Culvert Lengths

The following simplified procedure can be used to determine culvert lengths needed for new stream crossings or ditch-relief drains. Refer to Figure 1 for specific locations and distances described in the step-by-step procedure. A complete example follows these instructions.

1. Estimate the depth of the fill (F) at the running surface on the inside of the road above the culvert inlet (point "a").
2. Additional width (C) due to fill is then estimated as 1.5 times the fill depth (F) (that is, all fill slopes are assumed to be 1.5:1 in steepness).
3. Add half the road width ($1/2 W$) and the fill width (C). Measure this distance horizontally upstream from the center line of the road, and place stake at location A. The horizontal

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distance must be converted to slope distance before you can tape it off on the ground. Use Table 4 to convert horizontal distance to slope distance (on-the-ground distance).

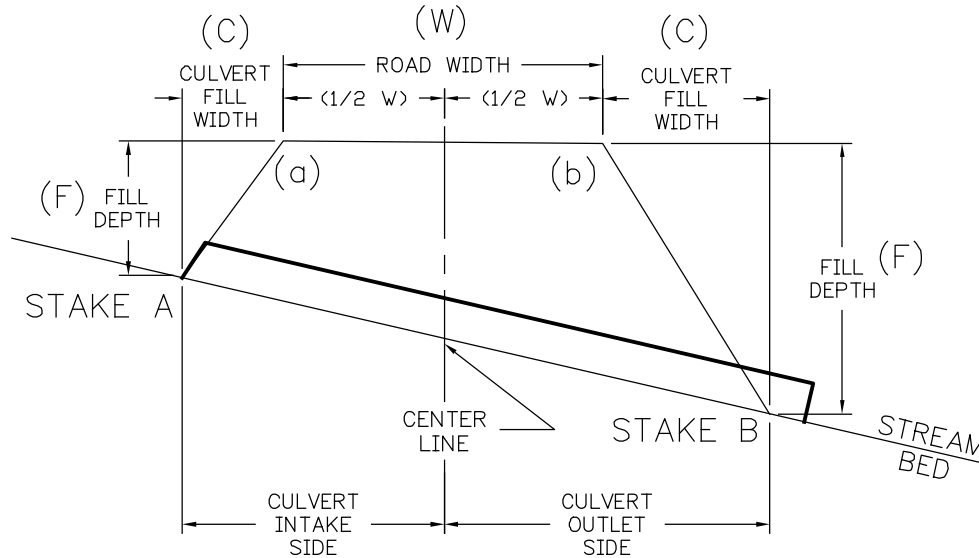


Figure 1—Culvert Length

4. Repeat steps 1 through 3 for the culvert outlet side of the crossing and place stake at location B.
5. Measure the slope length between stakes A and B. This measurement, plus two to four extra feet, is the length of culvert needed for the installation. The extra several feet are added to extend the inlet and outlet beyond the edge of the fill.

Forty-four feet horizontal distance equals 52.4 feet slope distance on a 65 percent slope.

horizontal distance $\times$ correction factor = slope distance

$$(44\text{ft}) \times (1.19) = 52.4'$$

Example: What culvert length is needed for a 14' wide road crossing a stream with a 55 percent gradient? The estimated inside fill-depth, above the culvert inlet, will be 6' and the fill-depth above the outlet will be 13'.

Step 1: Estimated depth of fill (F) at culvert inlet = 6'

Step 2: $(C) = 1.5 \times 6' = 9'$

Step 3: 14' wide road (W), so $1/2 \times 14' = 7'$

Stake A (the location of the culvert inlet) should be placed on the ground a distance of $(9' + 7') = 16$ horizontal feet up the stream channel from the flagged centerline of the road. According to the correction table, 16 feet horizontally on a 55 percent slope is 18.2' slope distance $(16' \times 1.14 = 18.2')$.

Place the inlet stake (A) 18.2' up the channel from the centerline of the road.

Step 4: Estimated depth of fill (F) at culvert outlet = 13'

Step 5: (C) = $1.5 \times 13' = 20'$

Step 6: 14' wide road (W), so $1/2 \times 14 = 7'$

Stake B (the location of the culvert outlet) should be placed on the ground a distance of $(13' + 20') = 33'$ horizontal feet down the stream channel from the flagged centerline of the road. According to the correction table, 33 feet horizontally on a 55 percent slope is 37.6' slope distance ($33' \times 1.14 = 37.6'$).

Place the outlet stake (B) 37.6' down the channel from the centerline of the road.

Step 7: Length of culvert needed = $18.2' + 37.6' = 55.8'$ or about 56'.

Approximately 2'-4' should be added to this length to make sure the culvert inlet and outlet extend sufficiently beyond the base of the fill.

Final culvert length to be ordered and delivered to the site = $56' + 4' = 60'$.

Table 4—Slope Correction Factors to (C) on Vertical-Horizontal Distance to Slope Distance

Hill slope or stream channel gradient (%)	Correction factor (multiplier)	Hill slope or stream channel gradient (%)	Correction factor (multiplier)
10	1.00 ¹	45	1.10
15	1.01	50	1.12
20	1.02	55	1.14
25	1.03	60	1.17
30	1.04	65	1.19
35	1.06	70	1.22
40	1.08	75	1.25

¹ For a slope of 10 percent or less, no correction factor is needed.

D. Culvert Installation for Ditch Relief

Insloped roads should be constructed: 1) where road-surface drainage discharged over the fillslope would cause unacceptable erosion or discharge directly into stream channels, 2) where fillslopes are unstable, or 3) where outsloping would create unsafe conditions for use. It is generally preferable to outslope road surfaces in order to disperse road-surface runoff before it has a chance to concentrate.

Insloped roads should be built with an inside drainage ditch to collect and remove road surface runoff (TA 501, *Roads—Construction*). Roads steeper than about 8 percent may be too steep for an inside ditch because of the potential for gully in the ditch. Inside ditches should also be drained at intervals sufficient to prevent ditch erosion or

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outlet gully, and at locations where water and sediment can be filtered before entering a watercourse. Filtering can be accomplished with thick vegetation, gentle slopes, settling basins, or filter windrows of woody debris and mulches secured to the slope.

As with outsloped roads, steep insloped road surfaces may be difficult to drain. Rolling dips (for permanent, surfaced roads and seasonal roads) or waterbars (for seasonal or temporary, unsurfaced roads) should be constructed at intervals sufficient to disperse road surface runoff from steep road segments. See TA 503, *Roads—Water Bars and Water Dips* for more information.

Ditches and culverts need occasional maintenance to maintain proper flow. Annual and storm-period inspection can prevent small problems from growing into large failures. When ditches become blocked by cutbank slumps, they need to be cleaned and the spoil deposited in a stable location. However, excessive maintenance (i.e., grading) can cause continuing and persistent erosion, sediment transport, and sediment pollution to local streams. It may also remove rock surfacing.

Ditch relief culverts should be designed and installed along the road at intervals close enough to prevent erosion of the ditch and at the culvert outfall, and at locations where collected water and sediment is not discharged directly into watercourses (Table 5).

Table 5—Maximum Suggested Spacing for Ditch Relief Culverts (ft)

Road grade (%)	Soil Credibility				
	Very High	High	Moderate	Slight	Very Low
2	600–800				
4	530	600–800			
6	355	585	600–800		
8	265	425	525	600–800	
10	160	340	420	555	
12	180	285	350	460	600–800
14	155	245	300	365	560
16	135	215	270	345	490
18	118	190	240	310	435

On new roads, ditch flow should be directed into a culvert and discharged into buffer areas and filter strips before it reaches a watercourse crossing. Ditches should neither be discharged directly into the inlet of a watercourse crossing culvert, nor should ditch relief culverts discharge into a watercourse without first directing flow through an adequate filter strip. In addition to installing ditch relief culverts on either approach to watercourse crossings, it is advisable to consider installing ditch drains before curves, above and below through-cut road sections, and before and after steep sections of the road.



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If a ditch is capable of transporting and delivering sediment to a Class I or Class II watercourse during a flood event, it can be said to function the same as a Class III watercourse. It has a bed and a bank, and it can transport sediment. Ditches which drain directly into watercourse-crossing culverts should be treated and protected from disturbance and erosion, just as is a Class III watercourse. Ditch relief culverts should be installed across ditched roads before water course crossings so that water and sediment can be filtered before reaching the stream.

Ditch relief culverts do not need to be large, since they carry flow only from the cutbank, springs, and a limited length of road surface. In areas of high erosion and/or storm runoff, nominal ditch relief culvert sizes should be 18", but ditch relief culverts should never be less than 15" diameter. Smaller culverts are too easily blocked (Figure 2). Generally, culverts should have a grade at least 2 percent greater than the ditch which feeds it to prevent sediment buildup and blockage. Where possible, ditch relief culverts should be installed at the gradient of the original ground slope, so it will emerge on the ground surface beyond the base of the fill. If this is not possible, the fill below the culvert outlet should be armored with rock or the culvert fitted with an anchored downspout to carry erosive flow past the base of the fill. Culverts should never be "shot-gunned" out of the fill, thereby creating highly erosive road drainage waterfalls (Figure 3).



Figure 2—Undersized Culvert

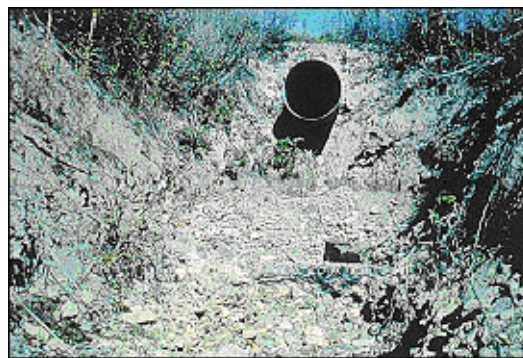


Figure 3—Culvert Not Installed at the Existing Stream Gradient

A 10 percent grade to the culvert will usually be self-cleaning. The culvert should be placed at a 30° angle to the ditch to improve inlet efficiency and prevent plugging and erosion at the inlet. The pipe should be covered by a minimum of 18" of compacted soil, or to a depth of 1.5 times the culvert diameter, whichever is greater. Finally, inlet protection such as rock armoring or drop structures can be used to help minimize erosion, slow flow velocity, and settle sediment before it is discharged through the pipe.

E. Culvert Installation for Stream Crossings

The importance of proper planning for stream crossings cannot be overstated. If stream crossings are not planned and located before road construction begins, serious problems may arise, including unintended damage to natural resources. Requirements for stream crossings vary from state to state. Often, a permit is required; check with the water division of the local natural resources agency.

Culverts can be considered dams that are designed to fail. The risk of culvert failure is substantial for most crossings, so *how* they fail is critical. In the upper sketch in

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Figure 4, the crossing has failed and the road grade has diverted the stream down the road, resulting in severe erosion and downstream sedimentation. Such damage to aquatic habitats can persist for many years. Stream diversions are easy to prevent, as illustrated by the lower sketch, in which the road grade was such that a failed crossing caused only some loss of road fill.

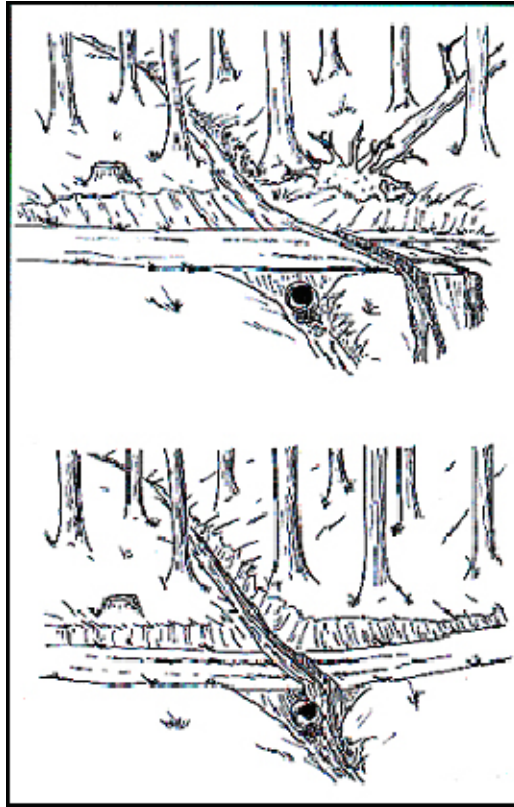


Figure 4—Stream Crossing Failures

Culverts should be installed as road work progresses. The culvert and its related drainage features should be installed via the following steps:

1. Place debris and slash to be used as a filter system, if needed.
2. Construct sediment ponds, if needed.
3. Complete downstream work first, such as energy dissipating devices and large rock riprap.
4. Route stream around work area until pipe is installed.
5. Construct pipe inlet structure.
6. Install culvert pipe.

A culvert inlet should be placed on the same level as the stream bottom. Where the culvert inlet has to be lower than the drainage gradient, a drop box can be constructed. The box provides a place for sediment to settle before water enters the culvert. Drop boxes require frequent maintenance.

Install culvert pipes as near as possible to the gradient of the natural channel and so there is no change in the stream bottom elevation (Figure 5). Culverts should not cause damming or pooling. Seat the culvert on firm ground and compact the earth at least halfway up the side of the pipe to prevent water from leaking. Pipe culverts must be adequately covered with fill; the rule is a minimum of 30" or 1.5 times the culvert diameter, whichever is greater.



Figure 5—Culvert Installed at Channel Gradient

If adequate cover cannot be achieved, an arch pipe or two small culverts should be installed. The cover must also be compacted to prevent settling in the road. Debris-laden material should not be used to cover pipe culverts.

The following are additional guidelines for installing culverts in streams:

- Limit construction activity in the water to periods of low or normal flow.
- Minimize use of equipment in streams.
- Use soil stabilization practices on exposed soil at stream crossings. Seed/mulch and install temporary sediment control structures, such as silt fences made of straw bales or geotextiles, immediately after road construction. Maintain these practices until the soil is permanently stabilized.
- Use materials that are clean, non-toxic, and which do not erode.

To prevent erosion and under-cutting of the inlet end of the culvert, provide a headwall. Sandbags containing some cement mixed with the sand, durable logs, concrete, or hand-placed riprap are suitable.

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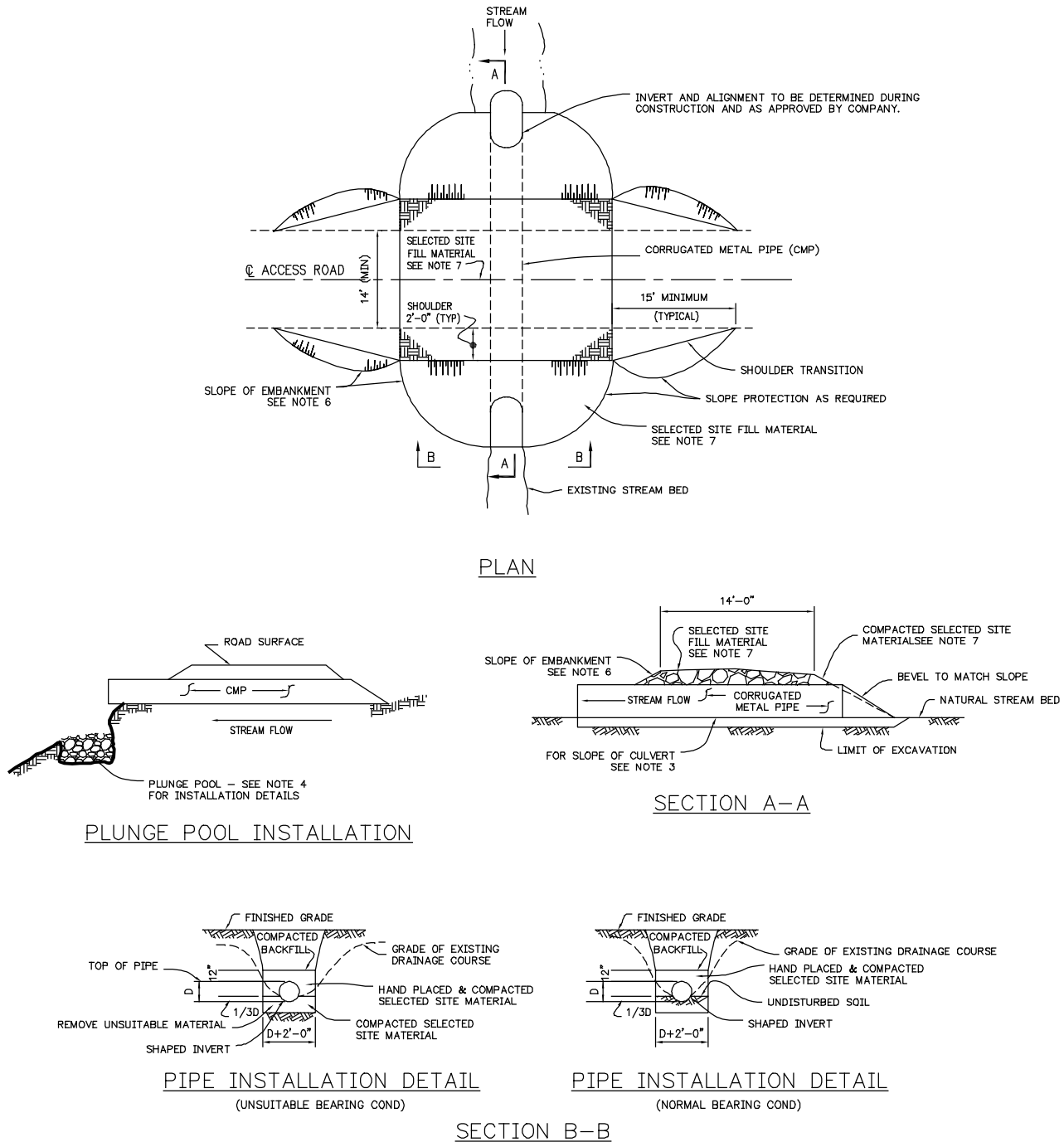


Figure 6—Stream Crossing Culverts

Installation Notes for Figure 6:

1. Culverts for existing drainage shall be aligned with the drainage.

2. Culverts for roadway and ditch drainage shall be oriented at an angle of 30° to 45° to the roadway. See TA 503, *Roads—Water Bars and Water Dips*, for installation instructions.
3. Culverts shall be sloped a minimum of 1 percent or at least 1 percent steeper than the existing drainage.
4. When the culvert outlet is above grade, a plunge pool shall be constructed with length and width equal to two pipe diameters and a depth of one pipe diameter. Line plunge pool with geotextile fabric filled with 2" to 8" rock.
5. Culvert clogging debris located within 50' of a culvert inlet shall be removed.
6. Cut and fill slopes will be determined during construction based on site conditions and as approved by the company.
7. See TA 501, *Roads—Construction*, for general road construction information.
8. Cover over culverts shall be 18" or 1.5 times the culvert diameter, whichever is greater. To minimize damage from culvert failure, height of fill over culverts shall be as close to minimum as practical.
9. Outlets on culverts with pipe slopes greater than 3 percent shall be protected with a 30' × 10' strip of geotextile fabric fastened to culvert as a bib. Fabric shall be weighted down with 6" to 8" rock to slow runoff.
10. Bottom of culvert shall be cushioned with fine-grain site material when installed over large rocks.

F. Fords

A ford is an alternative way to cross a water course where the streambed has a firm rock or coarse gravel bottom; the approaches are low and stable enough to support traffic; the stream is small to medium-sized, with water depth less than three feet and stream flows not exceeding 6 fps; and vehicle traffic is light. Dry fords can often be installed and used with minimal impact to the channel system.

The following standards apply when constructing a ford:

1. Install wing ditches, water-bars, dips, and level spreaders before the crossing. These structures should disperse runoff into an established and stable stream buffer.
2. If corduroy, coarse gravel, or gabion is used to create a driving surface, it should be installed flush with the streambed to minimize erosion and to allow fish passage.
3. Crossings should be at right angles to the stream.
4. Stabilize the approaches by using non-erodible material. The material should extend at least 50 feet on both sides of the crossing.
5. Requirements for stream crossings vary from state to state. Often a permit is required; check with the water division of the local natural resources agency.
6. Fords shall be designed for a low-maintenance long-term life. Rock size and grading, depth of rock, fabric underlayment, etc. and approaches shall be designed for the equipment expected to use the road.

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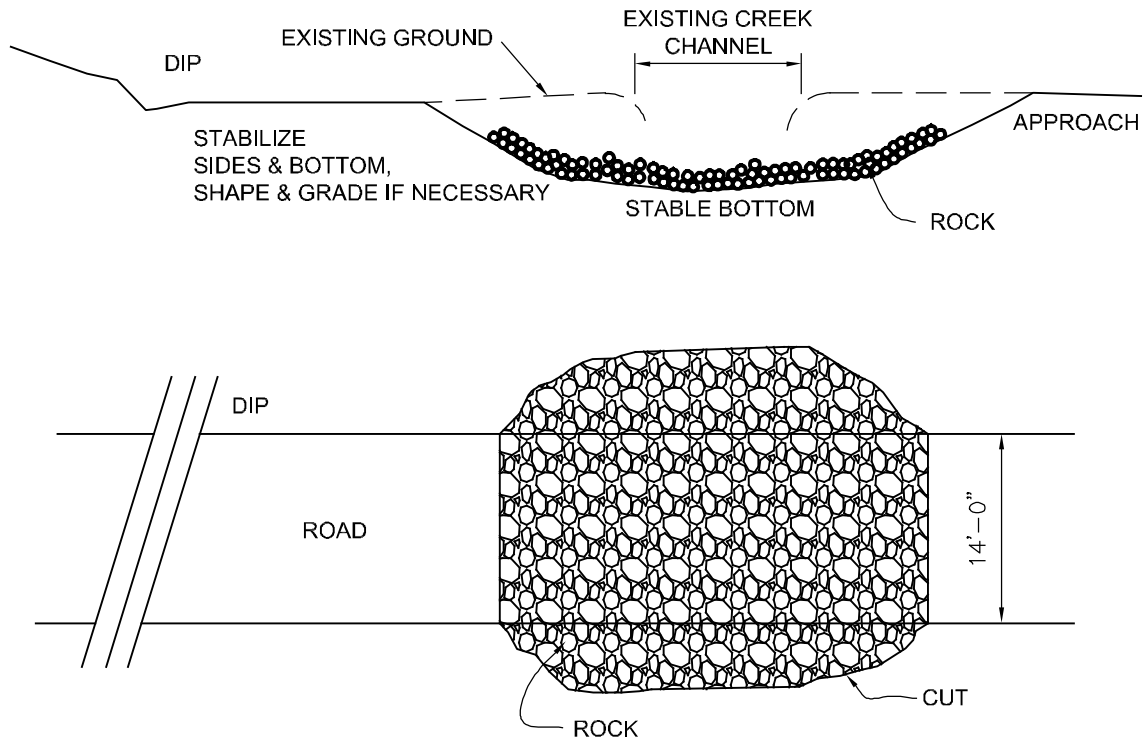


Figure 7 - Ford Stream Crossing

APPENDIX C – AGENCY AND STAKEHOLDER MEETINGS

Introduction

Appendix C contains a table (Table C-1) listing agency and stakeholder meetings and two tables (Tables C-2 and C-3) of public outreach initiated by the Applicant (PacifiCorp, doing business as Rocky Mountain Power).

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
Bureau of Land Management and U.S. Forest Service		
February 23, 2009	▪ Bureau of Land Management (BLM) Wyoming State Office ▪ BLM Las Vegas Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and BLM field office staff; identify BLM resource databases the third-party consultant will need to prepare the environmental impact statement (EIS); and discuss preliminary alternative routes.
February 24, 2009	▪ BLM Wyoming State Office ▪ BLM Ely District Office ▪ BLM Caliente Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and BLM district and field office staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
February 25, 2009	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Color Country District ▪ BLM Cedar City Field Office ▪ BLM Kanab Field Office ▪ BLM Richfield Field Office ▪ BLM St. George Field Office ▪ Dixie National Forest ▪ Rocky Mountain Power	Introduce and establish working relationships between BLM project management and BLM district and field office staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
March 11, 2009	▪ BLM Wyoming State Office ▪ BLM Grand Junction Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and BLM field office staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
March 12, 2009	▪ BLM Wyoming State Office ▪ BLM Moab Field Office ▪ Manti-La Sal National Forest ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships among BLM project management, BLM field office staff, and national forest; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
March 13, 2009	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ BLM Vernal Field Office ▪ Ashley National Forest ▪ Manti-La Sal National Forest ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management, BLM field office staff, and U.S. Forest Service (USFS) staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
March 17, 2009	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Rock Springs Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and BLM field office staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
March 18, 2009	▪ BLM Wyoming State Office ▪ BLM Little Snake Field Office ▪ BLM White River Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and BLM field office staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
March 19, 2009	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Fillmore Field Office ▪ BLM Salt Lake Field Office ▪ USFS Intermountain Region ▪ Fishlake National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ Utah Governor's Energy Advisor's Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships among BLM project management, BLM field office staff, and USFS staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
July 30, 2009	▪ BLM Wyoming State Office ▪ BLM Las Vegas Field Office ▪ BLM St. George Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and BLM field office staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
August 25, 2009	▪ BLM Wyoming State Office ▪ Ashley National Forest ▪ Manti-La Sal National Forest ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships among BLM project management and USFS staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
August 27, 2009	▪ BLM Wyoming State Office ▪ Dixie National Forest ▪ Fishlake National Forest	Introduce and establish working relationships among BLM project management and USFS staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
August 28, 2009	▪ BLM Wyoming State Office ▪ Uinta-Wasatch-Cache National Forest	Introduce and establish working relationships among BLM project management and USFS staff; identify BLM resource databases the consultant will need to prepare the EIS; and discuss preliminary alternative routes.
September 17, 2009	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Discuss resource issues associated with alternative routes identified in the BLM Price Field Office.
May 31, 2011	▪ BLM Wyoming State Office ▪ BLM Price Field Office	Reintroduce and discuss the Project.
June 2, 2011	▪ BLM Wyoming State Office ▪ BLM Moab Field Office	Reintroduce and discuss the Project.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
August 30, 2011	- BLM Wyoming State Office - BLM Colorado State Office - BLM Utah State Office	Brief the BLM State Directors on the status of the Project, including the results of project scoping.
November 30, 2011	- BLM Wyoming State Office - BLM Utah State Office - Western Area Power Administration (representing the TransWest Express project) - Dixie National Forest	Coordination meeting of the BLM, Western Area Power Administration, and USFS to discuss consistency of study and analysis approaches for the two projects.
April 12, 2012	- BLM Wyoming State Office - Dixie National Forest - Western Area Power Administration (representing the TransWest Express project)	Coordination meeting of the BLM, USFS staff, and Western Area Power Administration to discuss consistency of study and analysis approaches for biological and visual resources for the two projects.
May 2, 2012	- BLM Wyoming State Office - Dixie National Forest - Manti-La Sal National Forest - Uinta-Wasatch-Cache National Forest	Coordination meeting of the BLM, USFS, and the third-party contractors for the Energy Gateway South (EPG) and TransWest Express (AECOM) projects to discuss consistency of analysis for inventoried roadless areas and unroaded and undeveloped areas.
May 16, 2012	- BLM Wyoming State Office - Uinta-Wasatch-Cache National Forest - Dixie National Forest	BLM and USFS management briefing to discuss the status Energy Gateway South, TransWest Express, and Sigurd to Red Butte No. 2 – 345kV transmission projects.
May 24, 2012	- BLM Wyoming State Office - Western Area Power Administration	Coordination meeting of the BLM, Western Power Administration, and the third-party contractors for the Energy Gateway South (EPG) and TransWest Express (AECOM) projects to discuss consistency of study and analysis approaches for the two projects.
October 3, 2012	- BLM Wyoming State Office - BLM Rawlins Field Office - BLM Rock Springs Field Office - BLM Colorado State Office - BLM Northwest District Office - BLM Utah State Office - BLM Price Field Office - BLM Vernal Field Office - Uinta-Wasatch-Cache National Forest - Dixie National Forest	Briefing on the status of the Project to the BLM State Directors and USFS management. Included discussion of the results of coordination efforts with the Agency Interdisciplinary Team and cooperating agencies on the review of impacts and route comparisons.
December 14, 2012	- BLM Wyoming State Office - BLM Utah State Office	Discuss sage-grouse issues and routing options in the Emma Park area in Utah.
January 22, 2013	- BLM Wyoming State Office - BLM Utah State Office - Rocky Mountain Power	Discuss sage-grouse issues and routing options in the Emma Park area, Utah, with Rocky Mountain Power.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
February 8, 2013	▪ BLM Wyoming State Office ▪ USFS Interdisciplinary Team	Discuss USFS specialist reports and comments related to a USFS decision.
March 12, 2013	▪ BLM Colorado State Office ▪ BLM Northwest District Office ▪ BLM Little Snake Field Office	Discuss agency-requested route adjustments.
March 13, 2013	▪ BLM Utah State Office ▪ BLM Vernal Field Office ▪ Dixie National Forest	Discuss agency-requested route adjustments.
April 24, 2013	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ Uinta-Wasatch-Cache National Forest ▪ Dixie National Forest ▪ Rocky Mountain Power	Discuss the Plan of Development for the Project as well as inventoried roadless areas.
May 24, 2013	▪ BLM Wyoming State Office ▪ USFS	Discuss analysis and documentation of effects on inventoried roadless areas and unroaded/undeveloped areas.
June 4, 2013	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Color Country District ▪ BLM Fillmore Field Office ▪ BLM Moab Field Office ▪ BLM Price Field Office ▪ BLM Richfield Field Office ▪ BLM Salt Lake Field Office ▪ BLM Vernal Field Office ▪ Dixie National Forest ▪ Uinta-Wasatch-Cache National Forest	Brief BLM and USFS management on the status of the Project and discuss an agency-preferred route and potential plan amendments.
June 6, 2013	▪ BLM Wyoming State Office ▪ BLM Colorado State Office ▪ BLM Northwest District Office ▪ BLM Little Snake Field Office ▪ BLM White River Field Office	Brief BLM management on the status of the Project and discuss an agency-preferred route and potential plan amendments.
June 7, 2013	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office	Brief BLM management on the status of the Project and discuss an agency-preferred route and potential plan amendments.
June 27, 2013	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office	Discuss routing issues and an agency-preferred route in southern Wyoming.
August 22, 2013	▪ BLM Wyoming State Office ▪ USFS	Discuss analysis and documentation of effects on inventoried roadless areas and unroaded/undeveloped areas.
October 22, 2013	▪ BLM Wyoming State Office ▪ USFS	Discuss USFS comments related to USFS decision.
October 30, 2013	▪ BLM Wyoming State Office ▪ USFS	Discuss USFS comments related to USFS decision.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
December 3, 2013	▪ BLM Washington Office ▪ BLM Wyoming State Office ▪ BLM Colorado State Office ▪ BLM Utah State Office ▪ BLM National Operations Center ▪ U.S. Department of the Interior, Office of Environmental Policy and Compliance ▪ U.S. Department of the Interior, Office of the Regional Solicitor ▪ USFS Intermountain Region ▪ Dixie National Forest	Brief BLM Washington Office on the status of the Project and review the print-ready Draft EIS.
December 16, 2013	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Vernal Field Office ▪ BLM National Transmission Support Team	Discuss resource issues associated with alternative routes in the BLM Vernal Field Office.
Other Cooperating Agencies		
May 21, 2009	▪ BLM Wyoming State Office ▪ Hill Air Force Base ▪ BLM West Desert District ▪ BLM Fillmore Field Office ▪ BLM Salt Lake Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships among BLM project management, BLM field office staff, and Hill Air Force Base; identify resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
June 2, 2009	▪ BLM Wyoming State Office ▪ Millard County (Utah) ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and Millard County; identify resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
June 12, 2009	▪ BLM Wyoming State Office ▪ BLM Little Snake Field Office ▪ Colorado State Land Board ▪ Colorado Division of Wildlife ▪ Moffat County	Discuss routing issues associated with alternative routes located within the BLM Little Snake Field Office and Moffat County.
April 1, 2010	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ USFS ▪ U.S. Army Corps of Engineers ▪ Utah Public Lands Policy Coordination Office ▪ Rocky Mountain Power	Discuss resource issues associated with alternative routes identified in the Nine Mile Canyon area of the BLM Price Field Office.
April 7, 2010	▪ BLM Wyoming State Office ▪ Duchesne County (Utah)	Discuss resource issues associated with alternative routes located in the Argyle Canyon area.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
July 29, 2010	■ BLM Wyoming State Office ■ BLM Rawlins Field Office ■ BLM Rock Springs Field Office ■ BLM Little Snake Field Office ■ U.S. Fish and Wildlife Service (FWS), Wyoming Ecological Services Field Office ■ Wyoming Governor’s Office ■ Wyoming Game and Fish Department ■ Carbon County (Wyoming) ■ Little Snake River Conservation District (Wyoming) ■ Saratoga-Encampment-Rawlins Conservation District (Wyoming) ■ Rocky Mountain Power	Discuss resource issues associated with alternative routes located in southern Wyoming.
June 1, 2011	■ BLM Wyoming State Office ■ Carbon County (Wyoming) ■ Sweetwater County (Wyoming) ■ Moffat County (Colorado)	Discuss alternative routes for the Energy Gateway South and TransWest Express projects.
September 13, 2011	Agency Interdisciplinary Team Meeting – Rawlins, Wyoming ■ BLM Wyoming State Office ■ BLM Rawlins Field Office ■ BLM Rock Springs Field Office ■ Wyoming Game and Fish Department ■ Sweetwater County (Wyoming) ■ Medicine Bow Conservation District (Wyoming) ■ Saratoga-Encampment-Rawlins Conservation District ■ Sweetwater County Conservation District	Review project management and administration protocols, review scoping activities and results, review alternative routes being carried forward, discuss potential plan amendments, review schedule, and discuss data collection and inventories.
September 14, 2011	Agency Interdisciplinary Team Meeting – Craig, Colorado ■ BLM Wyoming State Office ■ BLM Grand Junction Field Office ■ BLM Little Snake Field Office ■ BLM White River Field Office ■ FWS, Colorado Ecological Services Field Office ■ Colorado Parks and Wildlife ■ Utah Division of Wildlife Resources ■ Moffat County (Colorado) ■ Uintah County (Utah)	Review project management and administration protocols, review scoping activities and results, review alternative routes being carried forward, discuss potential plan amendments, review schedule, and discuss data collection and inventories.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
September 16, 2011	Agency Interdisciplinary Team Meeting – Price, Utah ▪ BLM Utah State Office ▪ BLM Fillmore Field Office ▪ BLM Moab Field Office ▪ BLM Price Field Office ▪ BLM Vernal Field Office ▪ Ashley National Forest ▪ Dixie National Forest ▪ Fishlake National Forest ▪ Manti-La Sal National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ FWS, Utah Ecological Services Field Office ▪ URMCC ▪ Utah Public Lands Policy Coordination Office ▪ Utah Division of Wildlife Resources ▪ Carbon County (Utah) ▪ Emery County (Utah) ▪ Sanpete County (Utah)	Review project management and administration protocols, review scoping activities and results, review alternative routes being carried forward, discuss potential plan amendments, review schedule, and discuss data collection and inventories.
October 27, 2011	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ Emery County (Utah)	Discuss resource issues associated with alternative routes in the San Rafael Swell area of the BLM Price Field Office.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
December 13, 2011	Agency Interdisciplinary Team Conference Call ▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Rock Springs Field Office ▪ BLM Colorado State Office ▪ BLM Little Snake Field Office ▪ BLM White River Field Office ▪ BLM Utah State Office ▪ BLM Fillmore Field Office ▪ BLM Moab Field Office ▪ Ashley National Forest ▪ Dixie National Forest ▪ Manti-La Sal National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ Bureau of Indian Affairs, Western Region ▪ FWS, Colorado Ecological Services Field Office ▪ FWS, Utah Ecological Services Field Office ▪ Utah Reclamation Mitigation and Conservation Commission (URMCC) ▪ Colorado Division of Parks and Wildlife ▪ Utah Division of Wildlife Resources ▪ Sweetwater County (Wyoming) ▪ Carbon County (Utah) ▪ Duchesne County (Utah) ▪ Uintah County (Utah)	Introduce and discuss the impact assessment and mitigation planning process, explain how the alternative routes will be screened and compared, as well as the status of the scoping report, alternative routes, resource inventory with the Agency Interdisciplinary Team.
December 15, 2011	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ Emery County (Utah)	Discuss resource issues associated with alternative routes in the San Rafael Swell area of the BLM Price Field Office.
May 13, 2012	▪ BLM Wyoming State Office ▪ Moffat County (Colorado)	Meeting with Moffat County Land Use Board to discuss detailed inventory review maps and identify input needed from Moffat County.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
July 17, 2012	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ BLM Richfield Field Office ▪ BLM Vernal Field Office ▪ Ashley National Forest ▪ Dixie National Forest ▪ Manti-La Sal National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ Utah Division of Wildlife Resources ▪ Carbon County (Utah) ▪ Duchesne County (Utah) ▪ Sanpete County (Utah)	Meeting with Carbon, Duchesne, and Sanpete counties, as well as the USFS to discuss routing options.
August 20, 2012	Agency Interdisciplinary Team Meeting – Price, Utah ▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Fillmore Field Office ▪ BLM Moab Field Office ▪ BLM Price Field Office ▪ BLM Richfield Field Office ▪ BLM Vernal Field Office ▪ USFS Intermountain Region ▪ Ashley National Forest ▪ Dixie National Forest ▪ Manti-La Sal National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ FWS, Utah Ecological Services Field Office ▪ URMCC ▪ Bureau of Indian Affairs, Uintah and Ouray Agency ▪ Utah Division of Wildlife Resources ▪ Utah Public Lands Policy Coordination Office ▪ Carbon County (Utah) ▪ Emery County (Utah) ▪ Sanpete County (Utah) ▪ Wyoming Coalition of Governments (representing Wyoming counties)	Meet with the Agency Interdisciplinary Team to review results of the impact assessment and mitigation planning, review the approach and results of the alternative route screening and comparison, and review and discuss alternative routes to be considered in detail in the EIS.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
August 21, 2012	▪ BLM Wyoming State Office ▪ Dixie National Forest ▪ Uinta-Wasatch-Cache National Forest	Discuss resource issues associated with alternative routes on the national forest.
August 22, 2012	Agency Interdisciplinary Team Meeting – Craig, Colorado ▪ BLM Wyoming State Office ▪ BLM Grand Junction Field Office ▪ BLM Little Snake Field Office ▪ BLM White River Field Office ▪ BLM National Operations Center ▪ FWS, Colorado Ecological Services Field Office ▪ Colorado Parks and Wildlife ▪ Moffat County (Colorado) ▪ Uintah County (Utah)	Meet with the Agency Interdisciplinary Team to review results of the impact assessment and mitigation planning, review the approach and results of the alternative route screening and comparison, and review and discuss alternative routes to be considered in detail in the EIS.
August 23, 2012	Agency Interdisciplinary Team Meeting – Rawlins, Wyoming ▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Rock Springs Field Office ▪ FWS, Wyoming Ecological Services Field Office ▪ Wyoming Governor's Office ▪ Wyoming Game and Fish Department ▪ Carbon County (Wyoming) ▪ Sweetwater County (Wyoming) ▪ Little Snake River Conservation District (Wyoming) ▪ Saratoga-Rawlins-Encampment Conservation District (Wyoming) ▪ Wyoming Coalition of Governments	Meet with the Agency Interdisciplinary Team to review results of the impact assessment and mitigation planning, review the approach and results of the alternative route screening and comparison, and review and discuss alternative routes to be considered in detail in the EIS.
September 6, 2012	▪ BLM Wyoming State Office ▪ URMCC	Discuss routing issues associated with alternative routes crossing properties managed by the URMCC.
September 10, 2012	▪ BLM Wyoming State Office ▪ Moffat County	Meeting with Moffat County Land Use Board and Rocky Mountain Power to discuss the Project.
November 8, 2012	▪ BLM Wyoming State Office ▪ URMCC	Meeting with the URMCC (a cooperating agency) to introduce and discuss the Project with other members of the Central Utah Project Bonneville Unit Working Group (including the Bureau of Reclamation and Central Utah Water Conservancy District).

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
November 16, 2012	▪ BLM ▪ USFS ▪ FWS ▪ Utah Division of Wildlife Resources ▪ Colorado Parks and Wildlife ▪ Wasatch County (Utah) ▪ Duchesne County (Utah) ▪ Carbon County (Utah) ▪ Sweetwater County Conservation District ▪ Saratoga-Encampment-Rawlins Conservation District ▪ URMCC ▪ Uintah Basin Adaptive Resource Management Local Working Group ▪ Rocky Mountain Power	Meeting to initiate and discuss the greater sage-grouse habitat equivalent analysis (HEA) process.
December 12, 2012	▪ BLM ▪ USFS ▪ FWS ▪ Colorado Parks and Wildlife ▪ Wyoming Game and Fish Department ▪ Uintah County (Utah) ▪ Rocky Mountain Power	Meeting to summarize the HEA process and the relationship to the National Environmental Policy Act (NEPA) process; confirm use of the framework for sage-grouse impacts analysis.
December 19, 2012	▪ BLM Wyoming State Office ▪ BLM Northwest District Office ▪ BLM Little Snake Field Office ▪ National Park Service ▪ Colorado Parks and Wildlife	Discuss routing issues along U.S. Highway 40 in the vicinity of the Tuttle Ranch Conservation Easement and the Deerlodge Road entrance of Dinosaur National Monument.
January 23, 2013	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Vernal Field Office ▪ Dixie National Forest	Discuss and review the schedule for Section 7 consultation, requirements for any field surveys in support of the consultation, and discuss the EIS and consultation schedules.
January 24, 2013	▪ BLM Wyoming State Office ▪ BLM Little Snake Field Office ▪ FWS, Colorado Ecological Services Field Office	Discuss and review the schedule for Section 7 consultation, requirements for any field surveys in support of the consultation, and discuss the EIS and consultation schedules.
January 25, 2013	▪ BLM ▪ FWS ▪ Colorado Parks and Wildlife ▪ Utah Division of Wildlife Resources	Meeting to discuss parameters to be included in the sage-grouse HEA.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
January 28, 2013	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ FWS, Wyoming Ecological Services Field Office	Discuss and review the schedule for Section 7 consultation, requirements for any field surveys in support of the consultation, and discuss the EIS and consultation schedules.
January 31, 2013	▪ BLM ▪ FWS	Meeting to review the proposed HEA habitat services metric.
February 5, 2013	Agency Interdisciplinary Team Meeting – Rawlins, Wyoming ▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ Wyoming Governor’s Office ▪ Carbon County (Wyoming) ▪ Sweetwater County (Wyoming) ▪ Saratoga-Rawlins-Encampment Conservation District (Wyoming)	Discuss agency comments on the first internal Draft EIS, review route adjustments to be incorporated into the second internal Draft EIS, and begin discussion of an agency-preferred alternative route.
February 6, 2013	Agency Interdisciplinary Team Meeting – Craig, Colorado ▪ BLM Wyoming State Office ▪ BLM Colorado State Office ▪ BLM Little Snake Field Office ▪ BLM White River Field Office ▪ BLM National Operations Center ▪ National Park Service ▪ Colorado Parks and Wildlife ▪ Moffat County (Colorado) ▪ Uintah County (Utah)	Discuss agency comments on the first internal Draft EIS, review route adjustments to be incorporated into the second internal Draft EIS, and begin discussion of an agency-preferred alternative route.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
February 7, 2013	Agency Interdisciplinary Team Meeting – Rawlins, Wyoming ▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Fillmore Field Office ▪ BLM Moab Field Office ▪ BLM Price Field Office ▪ BLM Vernal Field Office ▪ Bureau of Indian Affairs, Uintah and Ouray Agency ▪ Dixie National Forest ▪ Fishlake National Forest ▪ Manti-La Sal National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ URMCC ▪ Utah Division of Wildlife Resources ▪ Carbon County (Utah) ▪ Duchesne County (Utah) ▪ Emery County (Utah) ▪ Wasatch County (Utah)	Discuss agency comments on the first internal Draft EIS, review route adjustments to be incorporated into the second internal Draft EIS, and begin discussion of an agency-preferred alternative route.
February 28, 2013	▪ BLM ▪ FWS ▪ USFS ▪ U.S. Geological Survey	Discuss potential effects on clay phacelia and Deseret milkvetch.
March 4, 2013	▪ BLM ▪ FWS ▪ USFS	Discuss potential effects on migratory bird habitat.
March 14, 2013	▪ BLM ▪ FWS ▪ Colorado Parks and Wildlife ▪ Utah Division of Wildlife Resources ▪ Saratoga-Encampment-Rawlins Conservation District ▪ Rocky Mountain Power	Review comments received on the draft HEA.
March 15, 2013	▪ BLM ▪ FWS ▪ USFS	Discuss considerations pertinent to assessing the feasibility of the Project through Spanish Fork Canyon.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
March 20, 2013	Old Spanish National Historic Trail Stakeholder Meeting – Green River, Utah ▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Moab Field Office ▪ BLM Price Field Office ▪ National Park Service ▪ Old Spanish Trail Association	Discuss the Old Spanish National Historic Trail resources, qualities, values, associated setting, and primary uses in response to BLM Manual 6280.
March 21, 2013	Continental Divide National Scenic Trail Stakeholder Meeting – Rawlins, Wyoming ▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ USFS, Rocky Mountain Region ▪ Continental Divide Trail Coalition ▪ Continental Divide Trail Society ▪ Alliance for Historic Wyoming	Discuss the Continental Divide National Scenic Trail resources, qualities, values, associated setting, and primary uses in response to BLM Manual 6280.
March 21, 2013	Cherokee and Overland Historic Trails Stakeholder Meeting – Rawlins, Wyoming ▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ National Park Service ▪ Oregon-California Trails Association ▪ Alliance for Historic Wyoming	Discuss the Cherokee and Overland Historic Trail resources, qualities, values, associated setting, and primary uses in response to BLM Manual 6280.
March 28, 2013	▪ BLM Wyoming State Office ▪ National Park Service ▪ Rocky Mountain Power ▪ TransWest Express, LLC ▪ BLM Colorado State Office ▪ Colorado Parks and Wildlife	Preliminary meeting to discuss application for right-of-way to cross Deerlodge Road entrance of Dinosaur National Monument.
April 2, 2013	▪ BLM ▪ FWS	Discuss roles, responsibilities, timeframes for developing sage-grouse mitigation, and the sage-grouse analysis framework.
April, 4, 2013	▪ BLM ▪ FWS ▪ Rocky Mountain Power	Discuss the use of the sage-grouse framework for the Project and how direct and indirect impacts would be addressed in the HEA and the EIS.
April 24, 2013	▪ BLM ▪ FWS	Discuss the greater sage-grouse HEA; review the purpose of the mitigation plan and HEA documents within the sage-grouse framework.
April 29, 2013	▪ BLM ▪ FWS ▪ USFS	Discuss clay phacelia and Uinta Basin hookless cactus.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
July 17, 2013	▪ BLM ▪ FWS ▪ USFS	Discuss the analysis for potential effects on migratory bird habitat.
September 12, 2013	▪ BLM ▪ FWS ▪ USFS	Discuss additional conservation measures needed to minimize impacts on migratory bird habitat.
November 1, 2013	▪ BLM ▪ FWS ▪ USFS	Discuss data and methodology for assessing impacts on migratory birds and the process for refining conservation measures to minimize potential impacts on migratory bird habitat.
Tribes		
April 23, 2012	Ute Tribe	Introduce and discuss the Project with the Ute Tribe Energy & Minerals Department.
May 31, 2012	Presentation to Tri-Ute association ▪ Northern Ute Tribe ▪ Southern Ute Tribe ▪ Ute Mountain Tribe	Introduce and discuss the Project with the Tri-Ute association.
Local Governments		
April 20, 2009	Carbon County (Wyoming)	Discuss potential land use issues and permitting.
April 20, 2009	Sweetwater County (Wyoming)	Discuss potential land use issues and permitting.
April 20, 2009	Nephi City (Utah)	Discuss potential land use issues and permitting.
April 21, 2009	Daggett County (Utah)	Discuss potential land use issues and permitting.
April 21, 2009	Uintah County (Utah)	Discuss potential land use issues and permitting.
April 22, 2009	Duchesne County (Utah)	Discuss potential land use issues and permitting.
April 22, 2009	Milford City (Utah)	Discuss potential land use issues and permitting.
April 23, 2009	Naples City (Utah)	Discuss potential land use issues and permitting.
April 23, 2009	Fillmore City (Utah)	Discuss potential land use issues and permitting.
April 27, 2009	Beaver County (Utah)	Discuss potential land use issues and permitting.
April 30, 2009	Washington County (Utah)	Discuss potential land use issues and permitting.
May 4, 2009	Town of Baggs (Wyoming)	Discuss potential land use issues and permitting.
May 5, 2009	Moffat County (Colorado)	Discuss potential land use issues and permitting.
May 6, 2009	Town of Rangely (Colorado)	Discuss potential land use issues and permitting.
May 12, 2009	Mount Pleasant City (Utah)	Discuss potential land use issues and permitting.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
May 13, 2009	Sanpete County (Utah)	Discuss potential land use issues and permitting.
May 14, 2009	City of Green River (Utah)	Discuss potential land use issues and permitting.
May 14, 2009	Grand County (Utah)	Discuss potential land use issues and permitting.
May 18, 2009	Emery County (Utah)	Discuss potential land use issues and permitting.
May 19, 2009	Huntington City (Utah)	Discuss potential land use issues and permitting.
May 20, 2009	Carbon County (Utah)	Discuss potential land use issues and permitting.
May 20, 2009	Helper City (Utah)	Discuss potential land use issues and permitting.
May 20, 2009	Juab County (Utah)	Discuss potential land use issues and permitting.
May 28, 2009	Iron County (Utah)	Discuss potential land use issues and permitting.
June 5, 2009	Town of Ballard (Utah)	Discuss potential land use issues and permitting.
June 8, 2009	Garfield County (Colorado)	Discuss potential land use issues and permitting.
June 8, 2009	Rio Blanco County (Colorado)	Discuss potential land use issues and permitting.
June 9, 2009	Mesa County (Colorado)	Discuss potential land use issues and permitting.
June 9, 2009	Utah County (Utah)	Discuss potential land use issues and permitting.
June 10, 2009	Roosevelt City (Utah)	Discuss potential land use issues and permitting.
June 10, 2009	Wasatch County (Utah)	Discuss potential land use issues and permitting.
June 15, 2009	Beaver City (Utah)	Discuss potential land use issues and permitting.
June 15, 2009	Sevier County (Utah)	Discuss potential land use issues and permitting.
August 9, 2009	Town of Dixon (Wyoming)	Discuss potential land use issues and permitting.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO DECEMBER 2013		
Date	Agency/Organization	Meeting Topic
Interested Parties		
April 11, 2012	Interested Parties Meeting: ■ BLM Wyoming State Office ■ BLM Utah State Office ■ Dixie National Forest ■ Wyoming State Historic Preservation Office ■ Colorado State Historic Preservation Office ■ Utah Public Lands Policy Coordination Office ■ Huntington Eccles Scenic Byway ■ Old Spanish Trail Association ■ Oregon-California Trails Association	Introduce the Project; discuss the National Environmental Policy Act and Section 106 of the National Historic Preservation Act (NHPA); and discuss the purpose, use, and development of a Programmatic Agreement with interested parties that responded to the BLM's invitation.
July 25, 2013	Consulting Parties Meeting (Rawlins, Wyoming)	Review and discuss the content of the draft Programmatic Agreement.
July 26, 2013	Consulting Parties Meeting (Craig, Colorado)	Review and discuss the content of the draft Programmatic Agreement.
July 30, 2013	Consulting Parties Meeting (Price, Utah)	Review and discuss the content of the draft Programmatic Agreement.

TABLE C-2 APPLICANT-INITIATED PUBLIC OUTREACH SUMMARY (MAILINGS) JANUARY 2009 TO May 2013		
Mailing Type	Date	Number of Copies Sent
Company newsletter	June 2011	9,500
Letter to landowners - Wyoming	Up to May 2013	388
Letter to landowners - Colorado	Up to May 2013	650
Letter to landowners - Utah	Up to May 2013	5,614

TABLE C-3 APPLICANT-INITIATED PUBLIC OUTREACH SUMMARY (MEETINGS) JANUARY 2009 TO MARCH 2013		
Meeting Type/Title	Date	City, State
Briefing with Six County Association of Governments	January 7, 2009	Richfield, Utah
Briefing with Cedar City Chamber of Commerce	January 8, 2009	Cedar City, Utah
Briefing with Southeastern Utah Association of Governments	January 8, 2009	Price, Utah
Briefing with Garfield County, Colorado	January 12, 2009	Glenwood Springs, Colorado
Briefing with Moffat County, Colorado	January 12, 2009	Craig, Colorado
Briefing with Mesa County, Colorado	January 13, 2009	Grand Junction, Colorado
Briefing with Five County Association of Governments	January 21, 2009	St. George, Utah
Briefing with Uintah Basin Association of Governments	January 22, 2009	Vernal, Utah
Briefing with Six County Association of Governments	February 3, 2009	St. George, Utah
Briefing with Iron County Coordinating Council	February 4, 2009	Parowan, Utah

**TABLE C-3
APPLICANT-INITIATED PUBLIC OUTREACH SUMMARY (MEETINGS)
JANUARY 2009 TO MARCH 2013**

Meeting Type/Title	Date	City, State
Briefing with Southeastern Utah Association of Local Governments (Sanpete, Sevier, Piute, Millard Counties)	February 5, 2009	Richfield, Utah
Briefing with Associated Governments of Northwestern Colorado	February 12, 2009	Rifle, Colorado
Energy Gateway Update for Utah Municipal Power Agency Annual Member Meeting	March 6, 2009	Salt Lake City, Utah
Carbon County Planning Meeting	April 23, 2009	Price, Utah
Briefing to Southwest Utah Technical Task Force meeting	June 11, 2009	Utah
Briefing to Utah County Commissioners	June 23, 2009	Provo, Utah
Briefing to Ute Indian Tribe Business Council, Uintah and Ouray Indian Reservation	December 16, 2009	Fort Duchesne, Utah
Briefing at Vernal Chamber of Commerce meeting	January 11, 2011	Vernal, Utah
Briefing at Utah Valley Exchange Club meeting	January 19, 2011	Orem, Utah
Briefing at American Society of Civil Engineering meeting	February 17, 2011	Provo, Utah
Briefing to Moffat County Land Use Board	March 14, 2011	Craig, Colorado
Briefing to Rio Blanco County Commission	March 14, 2011	Meeker, Colorado
Meeting with landowners	April 5, 2011	Vernal, Utah
Meeting with landowners	April 6, 2011	Rangely, Colorado
Meeting with landowners	April 7, 2011	Baggs, Wyoming
Meeting with landowners	April 7, 2011	Craig, Colorado
Meeting with landowners	April 13, 2011	Green River, Utah
Meeting with landowners	April 14, 2011	Price, Utah
Briefing to Grand County Council	April 19, 2011	Moab, Utah
Meeting with landowners	April 20, 2011	Mt. Pleasant, Utah
Meeting with landowners	April 21, 2011	Nephi, Utah
Briefing to Moffat County Land Use Board	May 16, 2011	Craig, Colorado
Meeting with Energy & Minerals Department, Ute Indian Tribe, Uintah and Ouray Indian Reservation	May 25, 2011	Fort Duchesne, Utah
Meeting with Carbon County (Wyoming), Sweetwater County (Wyoming), and Moffat County (Colorado)	June 3, 2011	Rawlins, Wyoming
Briefing to Carbon County Council of Governments	July 20, 2011	Dixon, Wyoming
Meeting with Realty Officer, Bureau of Indian Affairs	September 19, 2011	Fort Duchesne, Utah
Meeting with Wasatch County Planning Director	November 29, 2011	Heber City, Utah
Briefing during Wasatch County Public Lands Committee meeting	January 4, 2012	Heber City, Utah
Meeting with Energy & Minerals Department, Ute Indian Tribe, Uintah and Ouray Indian Reservation	April 23, 2012	Fort Duchesne, Utah
Briefing to Moffat County Planning and Zoning Board	August 4, 2012	Craig, Colorado
Briefing to Moffat County Land Use Board	September 10, 2012	Craig, Colorado
Community Working Group meeting 1	September 12, 2012	Rawlins, Wyoming
Community Working Group meeting 1	September 18, 2012	Salt Lake City, Utah
Community Working Group meeting 1	September 19, 2012	Nephi, Utah
Community Working Group meeting 1	September 20, 2012	Price, Utah
Community Working Group meeting 1	October 9, 2012	Vernal, Utah
Meeting with Uintah County Economic Development Director	November 15, 2012	Vernal, Utah
Briefing to the Nephi City Mayor and City Council	February 5, 2013	Nephi, Utah

APPENDIX D – CLIMATE AND AIR QUALITY SUPPORTING DATA

D.1 Emissions Summary Tables – Transmission Line and Series Compensation Station Construction

TABLE D-1 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-B AND ROUTE VARIATIONS				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM ₁₀	127.30	157.3	0.00	1.390
PM _{2.5}	12.70	15.7	0.00	0.140
Paved and Unpaved Road Dust – Conventional Steel Erection Option¹				
PM ₁₀	2,444.80	4,570.1	965.30	39.020
PM _{2.5}	246.00	459.9	97.10	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option¹				
PM ₁₀	2,522.80	4,404.4	895.60	38.250
PM _{2.5}	253.90	443.2	90.10	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option¹				
CO	26.80	54.7	6.60	0.430
NO _x	24.20	49.6	5.90	0.390
PM ₁₀	1.60	3.2	0.40	0.030
PM _{2.5}	1.60	3.2	0.40	0.030
SO ₂	0.10	0.3	0.03	0.002
VOC	1.80	3.8	0.40	0.030
Nonroad Engine Emissions – Steel Erection Using Helicopters Option¹				
CO	25.70	43.8	5.10	0.370
NO _x	23.10	38.9	4.50	0.320
PM ₁₀	1.60	2.6	0.30	0.020
PM _{2.5}	1.60	2.6	0.30	0.020
SO ₂	0.10	0.2	0.02	0.002
VOC	1.80	3.0	0.30	0.020
Helicopter Emissions – Conventional Steel Erection Option¹				
CO	0.20	2.2	0.40	0.010
NO _x	0.30	3.1	0.50	0.020
PM ₁₀	0.01	0.1	0.02	0.001
PM _{2.5}	0.01	0.1	0.02	0.001
SO ₂	0.04	0.4	0.10	0.003
VOC	0.20	1.8	0.30	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option¹				
CO	1.30	2.3	0.40	0.020
NO _x	2.20	3.4	0.50	0.030
PM ₁₀	0.10	0.1	0.02	0.001
PM _{2.5}	0.10	0.1	0.02	0.001
SO ₂	0.30	0.4	0.10	0.004
VOC	1.00	1.9	0.30	0.020

TABLE D-1 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-B AND ROUTE VARIATIONS				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Traffic Emissions – Conventional Steel Erection Option¹				
CO	2.90	5.8	0.80	0.050
NO _x	5.70	11.5	1.60	0.090
PM ₁₀	0.40	0.8	0.10	0.010
PM _{2.5}	0.30	0.6	0.10	0.010
SO ₂	0.04	0.1	0.01	0.001
VOC	0.90	1.6	0.30	0.010
Traffic Emissions – Steel Erection Using Helicopters Option¹				
CO	2.90	5.4	0.70	0.040
NO _x	5.80	10.9	1.50	0.090
PM ₁₀	0.40	0.7	0.10	0.010
PM _{2.5}	0.30	0.6	0.10	0.005
SO ₂	0.04	0.1	0.01	0.001
VOC	0.90	1.5	0.30	0.010
NOTES: ¹ Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection. CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds				

TABLE D-2 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-C AND ROUTE VARIATIONS				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM ₁₀	130.20	160.90	0.00	1.380
PM _{2.5}	13.00	16.10	0.00	0.140
Paved and Unpaved Road Dust – Conventional Steel Erection Option¹				
PM ₁₀	2,515.30	4,701.90	993.10	39.020
PM _{2.5}	253.10	473.10	99.90	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option¹				
PM ₁₀	2,595.50	4,531.50	921.50	38.250
PM _{2.5}	261.20	456.00	92.70	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option¹				
CO	27.60	56.30	6.70	0.430
NO _x	24.90	51.00	6.10	0.390
PM ₁₀	1.70	3.30	0.40	0.030
PM _{2.5}	1.70	3.30	0.40	0.030
SO ₂	0.10	0.30	0.03	0.002
VOC	1.90	3.90	0.50	0.030

TABLE D-2 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-C AND ROUTE VARIATIONS				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Nonroad Engine Emissions – Steel Erection Using Helicopters Option¹				
CO	26.40	45.10	5.30	0.370
NO _x	23.80	40.00	4.60	0.320
PM ₁₀	1.60	2.70	0.30	0.020
PM _{2.5}	1.60	2.70	0.30	0.020
SO ₂	0.10	0.20	0.02	0.002
VOC	1.80	3.10	0.30	0.020
Helicopter Emissions – Conventional Steel Erection Option¹				
CO	0.20	2.20	0.40	0.010
NO _x	0.30	3.20	0.50	0.020
PM ₁₀	0.01	0.10	0.02	0.001
PM _{2.5}	0.01	0.10	0.02	0.001
SO ₂	0.04	0.40	0.10	0.003
VOC	0.20	1.80	0.30	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option¹				
CO	1.30	2.40	0.40	0.020
NO _x	2.20	3.50	0.50	0.030
PM ₁₀	0.10	0.10	0.02	0.001
PM _{2.5}	0.10	0.10	0.02	0.001
SO ₂	0.30	0.50	0.10	0.004
VOC	1.00	2.00	0.30	0.020
Traffic Emissions – Conventional Steel Erection Option¹				
CO	2.90	6.00	0.80	0.050
NO _x	5.90	11.80	1.60	0.090
PM ₁₀	0.40	0.80	0.10	0.010
PM _{2.5}	0.30	0.60	0.10	0.010
SO ₂	0.04	0.10	0.01	0.001
VOC	0.90	1.70	0.30	0.010
Traffic Emissions – Steel Erection Using Helicopters Option¹				
CO	3.00	5.60	0.80	0.040
NO _x	5.90	11.20	1.50	0.090
PM ₁₀	0.40	0.70	0.10	0.010
PM _{2.5}	0.30	0.60	0.10	0.005
SO ₂	0.04	0.06	0.01	0.001
VOC	0.90	1.60	0.30	0.010
NOTES: ¹ Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection. CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds				

TABLE D-3 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-D AND ROUTE VARIATIONS				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM ₁₀	153.60	189.8	0.0	1.370
PM _{2.5}	15.40	19.0	0.0	0.140
Paved and Unpaved Road Dust – Conventional Steel Erection Option¹				
PM ₁₀	2,988.70	5,586.9	1,180.1	39.020
PM _{2.5}	300.70	562.2	118.7	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option¹				
PM ₁₀	3,084.10	5,384.4	1,094.9	38.250
PM _{2.5}	310.30	541.8	110.2	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option¹				
CO	32.80	66.8	8.00	0.430
NO _x	29.60	60.6	7.20	0.390
PM ₁₀	2.00	3.9	0.50	0.030
PM _{2.5}	2.00	3.9	0.50	0.030
SO ₂	0.10	0.3	0.03	0.002
VOC	2.30	4.6	0.50	0.030
Nonroad Engine Emissions – Steel Erection Using Helicopters Option¹				
CO	31.40	53.6	6.30	0.370
NO _x	28.20	47.5	5.50	0.320
PM ₁₀	1.90	3.2	0.40	0.020
PM _{2.5}	1.90	3.2	0.40	0.020
SO ₂	0.10	0.3	0.03	0.002
VOC	2.20	3.6	0.40	0.020
Helicopter Emissions – Conventional Steel Erection Option¹				
CO	0.30	2.7	0.40	0.010
NO _x	0.40	3.8	0.60	0.020
PM ₁₀	0.01	0.1	0.02	0.001
PM _{2.5}	0.01	0.1	0.02	0.001
SO ₂	0.10	0.5	0.10	0.003
VOC	0.20	2.2	0.40	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option¹				
CO	1.50	2.9	0.40	0.020
NO _x	2.60	4.2	0.60	0.030
PM ₁₀	0.10	0.1	0.02	0.001
PM _{2.5}	0.10	0.1	0.02	0.001
SO ₂	0.30	0.5	0.10	0.004
VOC	1.20	2.3	0.40	0.020
Traffic Emissions – Conventional Steel Erection Option¹				
CO	3.50	7.1	1.00	0.050
NO _x	7.00	14.0	1.90	0.090
PM ₁₀	0.50	0.9	0.10	0.010
PM _{2.5}	0.40	0.8	0.10	0.010
SO ₂	0.10	0.1	0.02	0.001
VOC	1.10	2.0	0.30	0.010

TABLE D-3 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-D AND ROUTE VARIATIONS				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Traffic Emissions – Steel Erection Using Helicopters Option¹				
CO	3.50	6.6	0.90	0.040
NO _x	7.10	13.3	1.80	0.090
PM ₁₀	0.50	0.9	0.10	0.010
PM _{2.5}	0.40	0.7	0.10	0.005
SO ₂	0.10	0.1	0.02	0.001
VOC	1.10	1.9	0.30	0.010
NOTES: ¹ Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection. CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds				

TABLE D-4 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-F AND ROUTE VARIATIONS				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM ₁₀	135.10	166.9	0.00	1.380
PM _{2.5}	13.50	16.7	0.00	0.140
Paved and Unpaved Road Dust – Conventional Steel Erection Option¹				
PM ₁₀	2,616.90	4,891.9	1,033.30	39.020
PM _{2.5}	263.30	492.2	104.00	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option¹				
PM ₁₀	2,700.40	4,714.5	958.70	38.250
PM _{2.5}	271.70	474.4	96.50	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option¹				
CO	28.70	58.5	7.00	0.430
NO _x	25.90	53.1	6.30	0.390
PM ₁₀	1.70	3.4	0.40	0.030
PM _{2.5}	1.70	3.4	0.40	0.030
SO ₂	0.10	0.3	0.03	0.002
VOC	2.00	4.0	0.50	0.030
Nonroad Engine Emissions – Steel Erection Using Helicopters Option¹				
CO	27.50	46.9	5.50	0.370
NO _x	24.70	41.6	4.80	0.320
PM ₁₀	1.70	2.8	0.30	0.020
PM _{2.5}	1.70	2.8	0.30	0.020
SO ₂	0.10	0.2	0.02	0.002
VOC	1.90	3.2	0.40	0.020

TABLE D-4 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-F AND ROUTE VARIATIONS				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Helicopter Emissions – Conventional Steel Erection Option¹				
CO	0.20	2.3	0.40	0.010
NO _x	0.30	3.4	0.60	0.020
PM ₁₀	0.01	0.1	0.02	0.001
PM _{2.5}	0.01	0.1	0.02	0.001
SO ₂	0.04	0.4	0.10	0.003
VOC	0.20	1.9	0.30	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option¹				
CO	1.30	2.5	0.40	0.020
NO _x	2.30	3.7	0.60	0.030
PM ₁₀	0.10	0.1	0.02	0.001
PM _{2.5}	0.10	0.1	0.02	0.001
SO ₂	0.30	0.5	0.10	0.004
VOC	1.10	2.0	0.30	0.020
Traffic Emissions – Conventional Steel Erection Option¹				
CO	3.10	6.2	0.90	0.050
NO _x	6.10	12.3	1.70	0.090
PM ₁₀	0.40	0.8	0.10	0.010
PM _{2.5}	0.30	0.7	0.10	0.010
SO ₂	0.05	0.1	0.01	0.001
VOC	1.00	1.7	0.30	0.010
Traffic Emissions – Steel Erection Using Helicopters Option¹				
CO	3.10	5.8	0.80	0.040
NO _x	6.20	11.6	1.60	0.090
PM ₁₀	0.40	0.8	0.10	0.010
PM _{2.5}	0.30	0.6	0.10	0.005
SO ₂	0.05	0.1	0.01	0.001
VOC	1.00	1.6	0.30	0.010
NOTES: ¹ Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection. CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds				

TABLE D-5 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-B				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM ₁₀	130.5	260.9	25.10	1.490
PM _{2.5}	13.0	26.1	2.50	0.150
Paved and Unpaved Road Dust – Conventional Steel Erection Option¹				
PM ₁₀	3,337.8	6,239.4	1,317.90	39.020
PM _{2.5}	335.9	627.8	132.60	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option¹				
PM ₁₀	3,444.3	6,013.3	1,222.80	38.250
PM _{2.5}	346.6	605.1	123.00	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option¹				
CO	68.7	149.5	20.20	0.850
NO _x	29.4	83.4	18.30	0.470
PM ₁₀	2.7	6.6	1.20	0.040
PM _{2.5}	2.7	6.6	1.20	0.040
SO ₂	0.1	0.4	0.10	0.002
VOC	5.4	11.3	1.40	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option¹				
CO	68.4	140.2	20.20	0.820
NO _x	29.1	74.2	18.30	0.440
PM ₁₀	2.6	6.1	1.20	0.040
PM _{2.5}	2.6	6.1	1.20	0.040
SO ₂	0.1	0.3	0.10	0.002
VOC	5.4	10.7	1.40	0.060
Helicopter Emissions – Conventional Steel Erection Option¹				
CO	0.0	2.5	1.40	0.010
NO _x	0.0	3.6	2.00	0.020
PM ₁₀	0.0	0.1	0.10	0.001
PM _{2.5}	0.0	0.1	0.10	0.001
SO ₂	0.0	0.5	0.30	0.003
VOC	0.0	2.0	1.10	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option¹				
CO	0.0	4.1	1.40	0.020
NO _x	0.0	6.5	2.00	0.030
PM ₁₀	0.0	0.2	0.10	0.001
PM _{2.5}	0.0	0.2	0.10	0.001
SO ₂	0.0	0.8	0.30	0.004
VOC	0.0	3.4	1.10	0.020
Traffic Emissions – Conventional Steel Erection Option¹				
CO	2.9	9.2	2.50	0.050
NO _x	6.1	18.7	4.90	0.110
PM ₁₀	0.4	1.3	0.30	0.010
PM _{2.5}	0.3	1.0	0.30	0.010
SO ₂	0.1	0.1	0.04	0.001
VOC	1.1	2.8	0.80	0.02

TABLE D-5 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-B				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Traffic Emissions – Steel Erection Using Helicopters Option¹				
CO	2.9	8.9	2.30	0.050
NO _x	6.1	18.3	4.60	0.100
PM ₁₀	0.4	1.2	0.30	0.010
PM _{2.5}	0.3	1.0	0.30	0.010
SO ₂	0.1	0.1	0.04	0.001
VOC	1.1	2.7	0.70	0.020
NOTES: ¹ Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection. CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds				

TABLE D-6 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-C				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM ₁₀	133.1	266.2	25.60	1.470
PM _{2.5}	13.3	26.6	2.60	0.150
Paved and Unpaved Road Dust – Conventional Steel Erection Option¹				
PM ₁₀	3,463.3	6,474.1	1,367.50	39.020
PM _{2.5}	348.5	651.5	137.60	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option¹				
PM ₁₀	3,573.8	6,239.4	1,268.80	38.250
PM _{2.5}	359.6	627.8	127.70	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option¹				
CO	71.3	155.1	21.00	0.850
NO _x	30.5	86.5	19.00	0.470
PM ₁₀	2.8	6.9	1.30	0.040
PM _{2.5}	2.8	6.9	1.30	0.040
SO ₂	0.1	0.4	0.10	0.002
VOC	5.6	11.8	1.40	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option¹				
CO	70.9	145.4	21.00	0.820
NO _x	30.2	77.0	19.00	0.440
PM ₁₀	2.7	6.3	1.30	0.040
PM _{2.5}	2.7	6.3	1.30	0.040
SO ₂	0.1	0.4	0.10	0.002
VOC	5.6	11.1	1.40	0.060

TABLE D-6 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-C				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Helicopter Emissions – Conventional Steel Erection Option¹				
CO	0.0	2.6	1.40	0.010
NO _x	0.0	3.7	2.10	0.020
PM ₁₀	0.0	0.1	0.10	0.001
PM _{2.5}	0.0	0.1	0.10	0.001
SO ₂	0.0	0.5	0.30	0.003
VOC	0.0	2.1	1.20	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option¹				
CO	0.0	4.3	1.40	0.020
NO _x	0.0	6.8	2.10	0.030
PM ₁₀	0.0	0.2	0.10	0.001
PM _{2.5}	0.0	0.2	0.10	0.001
SO ₂	0.0	0.8	0.30	0.004
VOC	0.0	3.5	1.20	0.020
Traffic Emissions – Conventional Steel Erection Option¹				
CO	3.0	9.5	2.60	0.050
NO _x	6.4	19.4	5.00	0.110
PM ₁₀	0.4	1.3	0.30	0.010
PM _{2.5}	0.4	1.1	0.30	0.010
SO ₂	0.1	0.1	0.04	0.001
VOC	1.1	2.9	0.80	0.020
Traffic Emissions – Steel Erection Using Helicopters Option¹				
CO	3.0	9.2	2.40	0.050
NO _x	6.4	19.0	4.70	0.100
PM ₁₀	0.4	1.3	0.30	0.010
PM _{2.5}	0.4	1.0	0.30	0.010
SO ₂	0.1	0.1	0.04	0.001
VOC	1.1	2.8	0.80	0.020
NOTES: ¹ Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection. CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds				

TABLE D-7 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-E				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM ₁₀	129.9	259.8	25.00	1.420
PM _{2.5}	13.0	26.0	2.50	0.140
Paved and Unpaved Road Dust – Conventional Steel Erection Option¹				
PM ₁₀	3,484.9	6,514.3	1,376.00	39.020
PM _{2.5}	350.7	655.5	138.50	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option¹				
PM ₁₀	3,596.0	6,278.2	1,276.60	38.250
PM _{2.5}	361.8	631.7	128.50	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option¹				
CO	71.7	156.1	21.10	0.850
NO _x	30.7	87.1	19.10	0.470
PM ₁₀	2.8	6.9	1.30	0.040
PM _{2.5}	2.8	6.9	1.30	0.040
SO ₂	0.1	0.4	0.10	0.002
VOC	5.6	11.8	1.40	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option¹				
CO	71.4	146.3	21.10	0.820
NO _x	30.4	77.4	19.10	0.440
PM ₁₀	2.7	6.4	1.30	0.040
PM _{2.5}	2.7	6.4	1.30	0.040
SO ₂	0.1	0.4	0.10	0.002
VOC	5.6	11.1	1.40	0.060
Helicopter Emissions – Conventional Steel Erection Option¹				
CO	0.0	2.6	1.40	0.010
NO _x	0.0	3.7	2.10	0.020
PM ₁₀	0.0	0.1	0.10	0.001
PM _{2.5}	0.0	0.1	0.10	0.001
SO ₂	0.0	0.5	0.30	0.003
VOC	0.0	2.1	1.20	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option¹				
CO	0.0	4.3	1.40	0.020
NO _x	0.0	6.8	2.10	0.030
PM ₁₀	0.0	0.2	0.10	0.001
PM _{2.5}	0.0	0.2	0.10	0.001
SO ₂	0.0	0.8	0.30	0.004
VOC	0.0	3.5	1.20	0.020
Traffic Emissions – Conventional Steel Erection Option¹				
CO	3.0	9.6	2.60	0.050
NO _x	6.4	19.5	5.10	0.110
PM ₁₀	0.5	1.3	0.40	0.010
PM _{2.5}	0.4	1.1	0.30	0.010
SO ₂	0.1	0.1	0.04	0.001
VOC	1.1	2.9	0.80	0.020

TABLE D-7 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-E				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Traffic Emissions – Steel Erection Using Helicopters Option¹				
CO	3.0	9.3	2.40	0.050
NO _x	6.4	19.1	4.80	0.100
PM ₁₀	0.5	1.3	0.30	0.010
PM _{2.5}	0.4	1.1	0.30	0.010
SO ₂	0.1	0.1	0.04	0.001
VOC	1.1	2.9	0.80	0.020
NOTES: ¹ Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection. CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds				

TABLE D-8 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-A AND ROUTE VARIATION				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM ₁₀	102.40	204.8	19.70	1.590
PM _{2.5}	10.20	20.5	2.00	0.160
Paved and Unpaved Road Dust – Conventional Steel Erection Option¹				
PM ₁₀	2,462.70	4,603.6	972.40	39.020
PM _{2.5}	247.80	463.2	97.80	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option¹				
PM ₁₀	2,541.30	4,436.7	902.20	38.250
PM _{2.5}	255.70	446.4	90.80	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option¹				
CO	50.70	110.3	14.90	0.850
NO _x	21.70	61.5	13.50	0.470
PM ₁₀	2.00	4.9	0.90	0.040
PM _{2.5}	2.00	4.9	0.90	0.040
SO ₂	0.10	0.3	0.10	0.002
VOC	4.00	8.4	1.00	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option¹				
CO	50.40	103.4	14.90	0.820
NO _x	21.50	54.7	13.50	0.440
PM ₁₀	1.90	4.5	0.90	0.040
PM _{2.5}	1.90	4.5	0.90	0.040
SO ₂	0.10	0.3	0.10	0.002
VOC	4.00	7.9	1.00	0.060

TABLE D-8 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-A AND ROUTE VARIATION				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Helicopter Emissions – Conventional Steel Erection Option¹				
CO	0.00	1.8	1.00	0.010
NO _x	0.00	2.6	1.50	0.020
PM ₁₀	0.00	0.1	0.04	0.001
PM _{2.5}	0.00	0.1	0.04	0.001
SO ₂	0.00	0.3	0.20	0.003
VOC	0.00	1.5	0.80	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option¹				
CO	0.00	3.1	1.00	0.020
NO _x	0.00	4.8	1.50	0.030
PM ₁₀	0.00	0.1	0.04	0.001
PM _{2.5}	0.00	0.1	0.04	0.001
SO ₂	0.00	0.6	0.20	0.004
VOC	0.00	2.5	0.80	0.020
Traffic Emissions – Conventional Steel Erection Option¹				
CO	2.10	6.8	1.80	0.050
NO _x	4.50	13.8	3.60	0.110
PM ₁₀	0.30	0.9	0.20	0.010
PM _{2.5}	0.30	0.8	0.20	0.010
SO ₂	0.04	0.1	0.03	0.001
VOC	0.80	2.1	0.60	0.020
Traffic Emissions – Steel Erection Using Helicopters Option¹				
CO	2.10	6.6	1.70	0.050
NO _x	4.50	13.5	3.40	0.100
PM ₁₀	0.30	0.9	0.20	0.010
PM _{2.5}	0.30	0.7	0.20	0.010
SO ₂	0.04	0.1	0.03	0.001
VOC	0.80	2.0	0.50	0.020
NOTES: ¹ Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection. CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds				

TABLE D-9 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-B AND ROUTE VARIATIONS				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM ₁₀	106.40	212.7	20.50	1.570
PM _{2.5}	10.60	21.3	2.00	0.160
Paved and Unpaved Road Dust – Conventional Steel Erection Option¹				
PM ₁₀	2,582.30	4,827.1	1,019.60	39.020
PM _{2.5}	259.80	485.7	102.60	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option¹				
PM ₁₀	2,664.60	4,652.1	946.00	38.250
PM _{2.5}	268.10	468.1	95.20	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option¹				
CO	53.20	115.6	15.70	0.850
NO _x	22.80	64.5	14.20	0.470
PM ₁₀	2.10	5.1	0.90	0.040
PM _{2.5}	2.10	5.1	0.90	0.040
SO ₂	0.10	0.3	0.10	0.002
VOC	4.20	8.8	1.10	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option¹				
CO	52.90	108.4	15.70	0.820
NO _x	22.50	57.4	14.20	0.440
PM ₁₀	2.00	4.7	0.90	0.040
PM _{2.5}	2.00	4.7	0.90	0.040
SO ₂	0.10	0.3	0.10	0.002
VOC	4.20	8.2	1.10	0.060
Helicopter Emissions – Conventional Steel Erection Option¹				
CO	0.00	1.9	1.10	0.010
NO _x	0.00	2.8	1.50	0.020
PM ₁₀	0.00	0.1	0.04	0.001
PM _{2.5}	0.00	0.1	0.04	0.001
SO ₂	0.00	0.4	0.20	0.003
VOC	0.00	1.5	0.90	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option¹				
CO	0.00	3.2	1.10	0.020
NO _x	0.00	5.1	1.50	0.030
PM ₁₀	0.00	0.1	0.04	0.001
PM _{2.5}	0.00	0.1	0.04	0.001
SO ₂	0.00	0.6	0.20	0.004
VOC	0.00	2.6	0.90	0.020
Traffic Emissions – Conventional Steel Erection Option¹				
CO	2.20	7.1	1.90	0.050
NO _x	4.70	14.5	3.80	0.110
PM ₁₀	0.30	1.0	0.30	0.010
PM _{2.5}	0.30	0.8	0.20	0.010
SO ₂	0.05	0.1	0.03	0.001
VOC	0.80	2.2	0.60	0.020

TABLE D-9 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-B AND ROUTE VARIATIONS				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Traffic Emissions – Steel Erection Using Helicopters Option¹				
CO	2.20	6.9	1.80	0.050
NO _x	4.70	14.1	3.50	0.100
PM ₁₀	0.30	1.0	0.20	0.010
PM _{2.5}	0.30	0.8	0.20	0.010
SO ₂	0.05	0.1	0.03	0.001
VOC	0.80	2.1	0.60	0.020
NOTES: ¹ Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection. CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds				

TABLE D-10 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-C AND ROUTE VARIATIONS				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM ₁₀	108.30	216.7	20.80	1.650
PM _{2.5}	10.80	21.7	2.10	0.160
Paved and Unpaved Road Dust – Conventional Steel Erection Option¹				
PM ₁₀	2,508.10	4,688.5	990.30	39.020
PM _{2.5}	252.40	471.8	99.70	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option¹				
PM ₁₀	2,588.10	4,518.6	918.80	38.250
PM _{2.5}	260.40	454.7	92.50	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option¹				
CO	51.60	112.3	15.20	0.850
NO _x	22.10	62.7	13.80	0.470
PM ₁₀	2.00	5.0	0.90	0.040
PM _{2.5}	2.00	5.0	0.90	0.040
SO ₂	0.10	0.3	0.10	0.002
VOC	4.10	8.5	1.00	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option¹				
CO	51.40	105.3	15.20	0.820
NO _x	21.90	55.7	13.80	0.440
PM ₁₀	2.00	4.6	0.90	0.040
PM _{2.5}	2.00	4.6	0.90	0.040
SO ₂	0.10	0.3	0.10	0.002
VOC	4.00	8.0	1.00	0.060

TABLE D-10 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-C AND ROUTE VARIATIONS				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Helicopter Emissions – Conventional Steel Erection Option¹				
CO	0.00	1.9	1.00	0.010
NO _x	0.00	2.7	1.50	0.020
PM ₁₀	0.00	0.1	0.04	0.001
PM _{2.5}	0.00	0.1	0.04	0.001
SO ₂	0.00	0.3	0.20	0.003
VOC	0.00	1.5	0.80	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option¹				
CO	0.00	3.1	1.00	0.020
NO _x	0.00	4.9	1.50	0.030
PM ₁₀	0.00	0.1	0.04	0.001
PM _{2.5}	0.00	0.1	0.04	0.001
SO ₂	0.00	0.6	0.20	0.004
VOC	0.00	2.5	0.80	0.020
Traffic Emissions – Conventional Steel Erection Option¹				
CO	2.20	6.9	1.90	0.050
NO _x	4.60	14.1	3.70	0.110
PM ₁₀	0.30	1.0	0.30	0.010
PM _{2.5}	0.30	0.8	0.20	0.010
SO ₂	0.04	0.1	0.03	0.001
VOC	0.80	2.1	0.60	0.020
Traffic Emissions – Steel Erection Using Helicopters Option¹				
CO	2.20	6.7	1.70	0.050
NO _x	4.60	13.7	3.40	0.100
PM ₁₀	0.30	0.9	0.20	0.010
PM _{2.5}	0.30	0.8	0.20	0.010
SO ₂	0.04	0.1	0.03	0.001
VOC	0.80	2.1	0.60	0.020
NOTES: ¹ Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection. CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds				

TABLE D-11 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-H				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM ₁₀	99.20	198.4	19.10	1.580
PM _{2.5}	9.90	19.8	1.90	0.160
Paved and Unpaved Road Dust – Conventional Steel Erection Option¹				
PM ₁₀	2,398.20	4,482.9	946.90	39.020
PM _{2.5}	241.30	451.1	95.30	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option¹				
PM ₁₀	2,474.70	4,320.4	878.50	38.250
PM _{2.5}	249.00	434.7	88.40	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option¹				
CO	49.40	107.4	14.50	0.850
NO _x	21.10	59.9	13.20	0.470
PM ₁₀	1.90	4.8	0.90	0.040
PM _{2.5}	1.90	4.8	0.90	0.040
SO ₂	0.10	0.3	0.10	0.002
VOC	3.90	8.1	1.00	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option¹				
CO	49.10	100.7	14.50	0.820
NO _x	20.90	53.3	13.20	0.440
PM ₁₀	1.90	4.4	0.90	0.040
PM _{2.5}	1.90	4.4	0.90	0.040
SO ₂	0.10	0.2	0.10	0.002
VOC	3.90	7.7	1.00	0.060
Helicopter Emissions – Conventional Steel Erection Option¹				
CO	0.00	1.8	1.00	0.010
NO _x	0.00	2.6	1.40	0.020
PM ₁₀	0.00	0.1	0.04	0.001
PM _{2.5}	0.00	0.1	0.04	0.001
SO ₂	0.00	0.3	0.20	0.003
VOC	0.00	1.4	0.80	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option¹				
CO	0.00	3.0	1.00	0.020
NO _x	0.00	4.7	1.40	0.030
PM ₁₀	0.00	0.1	0.04	0.001
PM _{2.5}	0.00	0.1	0.04	0.001
SO ₂	0.00	0.6	0.20	0.004
VOC	0.00	2.4	0.80	0.020
Traffic Emissions – Conventional Steel Erection Option¹				
CO	2.10	6.6	1.80	0.050
NO _x	4.40	13.4	3.50	0.110
PM ₁₀	0.30	0.9	0.20	0.010
PM _{2.5}	0.20	0.7	0.20	0.010
SO ₂	0.04	0.1	0.03	0.001
VOC	0.80	2.0	0.60	0.020

TABLE D-11 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-H				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Traffic Emissions – Steel Erection Using Helicopters Option¹				
CO	2.10	6.4	1.70	0.050
NO _x	4.40	13.1	3.30	0.100
PM ₁₀	0.30	0.9	0.20	0.010
PM _{2.5}	0.20	0.7	0.20	0.010
SO ₂	0.04	0.1	0.03	0.001
VOC	0.80	2.0	0.50	0.020
NOTES: ¹ Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection. CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds				

TABLE D-12 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-I				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM ₁₀	117.8	235.6	22.70	1.570
PM _{2.5}	11.8	23.6	2.30	0.160
Paved and Unpaved Road Dust – Conventional Steel Erection Option¹				
PM ₁₀	2,871.6	5,367.9	1,133.80	39.020
PM _{2.5}	289.0	540.1	114.10	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option¹				
PM ₁₀	2,963.2	5,173.3	1,052.00	38.250
PM _{2.5}	298.2	520.6	105.90	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option¹				
CO	59.1	128.6	17.40	0.850
NO _x	25.3	71.7	15.80	0.470
PM ₁₀	2.3	5.7	1.00	0.040
PM _{2.5}	2.3	5.7	1.00	0.040
SO ₂	0.1	0.3	0.10	0.002
VOC	4.6	9.8	1.20	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option¹				
CO	58.8	120.6	17.40	0.820
NO _x	25.0	63.8	15.80	0.440
PM ₁₀	2.3	5.2	1.00	0.040
PM _{2.5}	2.3	5.2	1.00	0.040
SO ₂	0.1	0.3	0.10	0.002
VOC	4.6	9.2	1.20	0.060

TABLE D-12 CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-I				
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Helicopter Emissions – Conventional Steel Erection Option¹				
CO	0.0	2.6	1.20	0.010
NO _x	0.0	3.7	1.70	0.020
PM ₁₀	0.0	0.1	0.05	0.001
PM _{2.5}	0.0	0.1	0.05	0.001
SO ₂	0.0	0.5	0.20	0.003
VOC	0.0	2.1	1.00	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option¹				
CO	0.0	3.6	1.20	0.020
NO _x	0.0	5.6	1.70	0.030
PM ₁₀	0.0	0.2	0.05	0.001
PM _{2.5}	0.0	0.2	0.05	0.001
SO ₂	0.0	0.7	0.20	0.004
VOC	0.0	2.9	1.00	0.020
Traffic Emissions – Conventional Steel Erection Option¹				
CO	2.5	7.9	2.10	0.050
NO _x	5.3	16.1	4.20	0.110
PM ₁₀	0.4	1.1	0.30	0.010
PM _{2.5}	0.3	0.9	0.20	0.010
SO ₂	0.1	0.1	0.03	0.001
VOC	0.9	2.4	0.70	0.020
Traffic Emissions – Steel Erection Using Helicopters Option¹				
CO	2.5	7.7	2.00	0.050
NO _x	5.3	15.7	3.90	0.100
PM ₁₀	0.4	1.1	0.30	0.010
PM _{2.5}	0.3	0.9	0.20	0.010
SO ₂	0.1	0.1	0.03	0.001
VOC	0.9	2.4	0.60	0.020
NOTES: ¹ Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection. CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds				

TABLE D-13 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-B AND ROUTE VARIATIONS				
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,695.6	9,728.8	1,151.4	76.17
Helicopter	131.2	1,279.6	213.3	7.94
Traffic	2,215.6	4,119.4	637.1	34.09
Steel Erection Using Helicopters Option				
Nonroad Engine	4,480.1	7,622.1	872.3	63.45
Helicopter	816.3	1,390.1	213.3	11.83
Traffic	2,245.2	3,913.4	607.0	33.08
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE D-14 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-C AND ROUTE VARIATIONS				
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,831.1	10,009.5	1,184.6	76.17
Helicopter	135.0	1,316.5	219.4	7.94
Traffic	2,279.5	4,238.2	655.5	34.09
Steel Erection Using Helicopters Option				
Nonroad Engine	4,609.3	7,842.0	897.5	63.45
Helicopter	839.8	1,430.2	219.4	11.83
Traffic	2,310.0	4,026.3	624.5	33.08
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE D-15 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-D AND ROUTE VARIATION				
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	5,740.4	11,893.4	1,407.5	76.17
Helicopter	160.4	1,564.3	260.7	7.94
Traffic	2,708.6	5,035.9	778.9	34.09
Steel Erection Using Helicopters Option				
Nonroad Engine	5,476.9	9,317.9	1,066.4	63.45
Helicopter	997.9	1,699.3	260.7	11.83
Traffic	2,744.8	4,784.2	742.1	33.08
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE D-16 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-F AND ROUTE VARIATIONS				
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	5,026.3	10,413.9	1,232.4	76.17
Helicopter	140.5	1,369.7	228.3	7.94
Traffic	2,371.6	4,409.4	682.0	34.09
Steel Erection Using Helicopters Option				
Nonroad Engine	4,795.6	8,158.8	933.8	63.45
Helicopter	873.8	1,487.9	228.3	11.83
Traffic	2,403.3	4,189.0	649.8	33.08
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE D-17 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-B				
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	5,691.4	16,759.3	3,572.8	93.21
Helicopter	0.0	1,451.5	808.9	8.10
Traffic	2,607.7	7,126.0	1,913.2	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	5,627.4	14,562.0	2,666.7	81.86
Helicopter	0.0	2,558.8	808.9	12.06
Traffic	2,607.7	6,985.3	1,815.4	40.86
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE D-18 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-C				
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	5,905.4	17,389.6	3,707.2	93.21
Helicopter	0.0	1,506.1	839.3	8.10
Traffic	2,705.8	7,394.0	1,985.2	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	5,839.0	15,109.7	2,767.0	81.86
Helicopter	0.0	2,655.0	839.3	12.06
Traffic	2,705.8	7,248.0	1,883.7	40.86
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE D-19 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-E				
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	5,942.1	17,497.7	3,730.2	93.21
Helicopter	0.0	1,515.5	844.5	8.10
Traffic	2,722.6	7,439.9	1,997.5	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	5,875.3	15,203.5	2,784.2	81.86
Helicopter	0.0	2,671.5	844.5	12.06
Traffic	2,722.6	7,293.1	1,895.4	40.86
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE D-20 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-A AND ROUTE VARIATION				
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,199.2	12,365.4	2,636.1	93.21
Helicopter	0.0	1,071.0	596.8	8.10
Traffic	1,924.0	5,257.7	1,411.6	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	4,152.0	10,744.2	1,967.5	81.86
Helicopter	0.0	1,887.9	596.8	12.06
Traffic	1,924.0	5,153.9	1,339.5	40.86
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE D-21 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-B AND ROUTE VARIATIONS				
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,403.1	12,965.7	2,764.1	93.21
Helicopter	0.0	1,123.0	625.8	8.10
Traffic	2,017.4	5,512.9	1,480.1	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	4,353.6	11,265.7	2,063.0	81.86
Helicopter	0.0	1,979.6	625.8	12.06
Traffic	2,017.4	5,404.1	1,404.5	40.86
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE D-22 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-C AND ROUTE VARIATIONS				
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,276.7	12,593.5	2,684.7	93.21
Helicopter	0.0	1,090.7	607.8	8.10
Traffic	1,959.5	5,354.7	1,437.6	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	4,228.6	10,942.4	2,003.8	81.86
Helicopter	0.0	1,922.8	607.8	12.06
Traffic	1,959.5	5,249.0	1,364.2	40.86
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE D-23 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-H				
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,089.2	12,041.3	2,567.0	93.21
Helicopter	0.0	1,042.9	581.2	8.10
Traffic	1,873.6	5,119.9	1,374.6	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	4,043.2	10,462.5	1,916.0	81.86
Helicopter	0.0	1,838.5	581.2	12.06
Traffic	1,873.6	5,018.8	1,304.3	40.86
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE D-24 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-I				
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,896.4	14,418.3	3,073.7	93.21
Helicopter	0.0	1,518.1	695.9	8.10
Traffic	2,243.5	6,130.6	1,646.0	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	4,841.3	12,527.9	2,294.2	81.86
Helicopter	0.0	2,201.4	695.9	12.06
Traffic	2,243.5	6,009.6	1,561.8	40.86
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE D-25 CRITERIA POLLUTANT EMISSIONS FOR SERIES COMPENSATION STATIONS (EACH SERIES COMPENSATION STATION)			
Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)
Fugitive Dust from Earthmoving and Grading Activities			
PM ₁₀	1.900	4.000	0.0000
PM _{2.5}	0.200	0.400	0.0000
Paved and Unpaved Road Dust			
PM ₁₀	1.400	4.300	3.4000
PM _{2.5}	0.100	0.400	0.4000
Nonroad Engine Emissions			
CO	5.600	9.900	6.6000
NO _x	5.000	5.400	6.3000
PM ₁₀	0.300	0.40	0.4000
PM _{2.5}	0.300	0.40	0.4000
SO ₂	0.010	0.010	0.0100
VOC	0.400	0.900	0.5000
Traffic Emissions			
CO	0.030	0.040	0.0300
NO _x	0.070	0.090	0.0600
PM ₁₀	0.010	0.010	0.0040
PM _{2.5}	0.004	0.010	0.0030
SO ₂	0.001	0.001	0.0004
VOC	0.010	0.020	0.0100
NOTES: CO = Carbon monoxide NO _x = Nitrogen oxides PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide VOC = Volatile organic compounds			

TABLE D-26 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR SERIES COMPENSATION STATIONS (EACH SERIES COMPENSATION STATION)			
Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)
Nonroad Engine	948.8	887.7	1,179.0
Traffic	35.4	53.6	24.5

D.2 Modeling Results Summary Tables – Transmission Line and Series Compensation Station Construction

TABLE D-27 MODELING RESULTS – TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVES WYCO-B, WYCO-C, WYCO-D, AND WYCO-F AND ROUTE VARIATIONS						
Pollutant	Averaging Period	Maximum AERSCREEN Concentration (µg/m³)	Background Concentration (µg/m³)	Project Impact plus Background (µg/m³)	Limiting Standard (µg/m³)	Comments
NO ₂	1-hour	1,307.2	55.7	1,362.9	188.7	May exceed the numerical value of the standards
PM ₁₀	24-hour	62.5	58.4	120.9	150.0	Below all ambient air quality standards
PM _{2.5}	24-hour	8.2	13.2	21.4	35.0	Below all ambient air quality standards
CO	1-hour	5,758.0	1,379.3	7,137.3	40,000.0	Below all ambient air quality standards
	8-hour	5,758.0	1,092.0	6,850.0	10,000.0	Below all ambient air quality standards
SO ₂	1-hour	3.2	13.2	16.3	196.4	Below all ambient air quality standards
	3-hour	3.2	10.3	13.4	700.0	Below all ambient air quality standards
NOTES: A factor of 80 percent was applied to estimated nitrogen oxides concentrations for conversion to nitrogen dioxide based on the Environmental Protection Agency's March 1, 2011, memorandum: <i>Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO₂ National Ambient Air Quality Standard</i> CO = Carbon monoxide NO ₂ = Nitrogen dioxide PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide						

TABLE D-28 MODELING RESULTS – TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVES COUT BAX-B, COUT BAX-C, AND COUT BAX-E						
Pollutant	Averaging Period	Maximum AERSCREEN Concentration (µg/m³)	Background Concentration (µg/m³)	Project Impact plus Background (µg/m³)	Limiting Standard (µg/m³)	Comments
NO ₂	1-hour	1,307.2	73.7	1,380.9	188.7	May exceed the numerical value of the standards
PM ₁₀	24-hour	62.5	78.8	141.4	150.0	Below all ambient air quality standards
PM _{2.5}	24-hour	8.2	19.9	28.1	35.0	Below all ambient air quality standards
CO	1-hour	5,758.0	1,954.0	7,712.0	40,000.0	Below all ambient air quality standards
	8-hour	5,758.0	1,264.4	7,022.4	10,000.0	Below all ambient air quality standards

TABLE D-28 MODELING RESULTS – TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVES COUT BAX-B, COUT BAX-C, AND COUT BAX-E						
Pollutant	Averaging Period	Maximum AERSCREEN Concentration (µg/m³)	Background Concentration (µg/m³)	Project Impact plus Background (µg/m³)	Limiting Standard (µg/m³)	Comments
SO ₂	1-hour	3.2	7.9	11.1	196.4	Below all ambient air quality standards
	3-hour	3.2	7.9	11.1	700.0	Below all ambient air quality standards
NOTES: A factor of 80 percent was applied to estimated nitrogen oxides concentrations for conversion to nitrogen dioxide based on the Environmental Protection Agency's March 1, 2011, memorandum: <i>Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO₂ National Ambient Air Quality Standard</i> CO = Carbon monoxide NO ₂ = Nitrogen dioxide PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide						

TABLE D-29 MODELING RESULTS – TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-A AND ROUTE VARIATION AND ALTERNATIVE COUT-B AND ROUTE VARIATIONS (EXCEPT UTAH COUNTY PM₁₀)						
Pollutant	Averaging Period	Maximum AERSCREEN Concentration (µg/m³)	Background Concentration (µg/m³)	Project Impact plus Background (µg/m³)	Limiting Standard (µg/m³)	Comments
NO ₂	1-hour	1,307.2	93.0	1,400.2	188.7	May exceed the numerical value of the standards
PM ₁₀	24-hour	62.5	78.8	141.4	150.0	Below all ambient air quality standards
PM _{2.5}	24-hour	8.2	19.8	28.0	35.0	Below all ambient air quality standards
CO	1-hour	5,758.0	4,367.8	10,125.8	40,000.0	Below all ambient air quality standards
	8-hour	5,758.0	1,724.1	7,482.1	10,000.0	Below all ambient air quality standards
SO ₂	1-hour	3.2	7.9	11.1	196.4	Below all ambient air quality standards
	3-hour	3.2	7.9	11.1	700.0	Below all ambient air quality standards
NOTES: A factor of 80 percent was applied to estimated nitrogen oxides concentrations for conversion to nitrogen dioxide based on the Environmental Protection Agency's March 1, 2011, memorandum: <i>Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO₂ National Ambient Air Quality Standard</i> CO = Carbon monoxide NO ₂ = Nitrogen dioxide PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide						

TABLE D-30 MODELING RESULTS – TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-A AND ROUTE VARIATION (UTAH COUNTY), ALTERNATIVE COUT-B AND ROUTE VARIATIONS (UTAH COUNTY), AND ALTERNATIVE COUT-C AND ROUTE VARIATIONS (UTAH COUNTY)						
Pollutant	Averaging Period	Maximum AERSCREEN Concentration (µg/m³)	Background Concentration (µg/m³)	Project Impact plus Background (µg/m³)	Limiting Standard (µg/m³)	Comments
PM ₁₀	24-hour	62.5	49.5	112.0	150.0	Below all ambient air quality standards
NOTE: PM ₁₀ = Particulate matter less than 10 micrometers						

TABLE D-31 MODELING RESULTS – TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-C AND ROUTE VARIATIONS AND ALTERNATIVES COUT-H AND COUT-I (EXCEPT UTAH COUNTY PM₁₀)						
Pollutant	Averaging Period	Maximum AERSCREEN Concentration (µg/m³)	Background Concentration (µg/m³)	Project Impact plus Background (µg/m³)	Limiting Standard (µg/m³)	Comments
NO ₂	1-hour	1,307.2	67.0	1,374.2	188.7	May exceed the numerical value of the standards
PM ₁₀	24-hour	62.5	78.8	141.4	150.0	Below all ambient air quality standards
PM _{2.5}	24-hour	8.2	14.5	22.7	35.0	Below all ambient air quality standards
CO	1-hour	5,758.0	4,367.8	10,125.8	40,000.0	Below all ambient air quality standards
	8-hour	5,758.0	1,724.1	7,482.1	10,000.0	Below all ambient air quality standards
SO ₂	1-hour	3.2	7.9	11.1	196.4	Below all ambient air quality standards
	3-hour	3.2	7.9	11.1	700.0	Below all ambient air quality standards
NOTES: A factor of 80 percent was applied to estimated nitrogen oxides concentrations for conversion to nitrogen dioxide based on the Environmental Protection Agency's March 1, 2011 memorandum: <i>Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO₂ National Ambient Air Quality Standard</i> CO = Carbon monoxide NO ₂ = Nitrogen dioxide PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide						

TABLE D-32 MODELING RESULTS – SERIES COMPENSATION STATION CONSTRUCTION EACH SERIES COMPENSATION STATION						
Pollutant	Averaging Period	Maximum AERSCREEN Concentration (µg/m³)	Background Concentration (µg/m³)	Project Impact plus Background (µg/m³)	Limiting Standard (µg/m³)	Comments
NO ₂	1-hour	4,950.4	67.0	5,017.4	188.7	May exceed the numerical value of the standards
PM ₁₀	24-hour	20.5	78.8	99.3	150.0	Below all ambient air quality standards
PM _{2.5}	24-hour	7.1	14.5	21.6	35.0	Below all ambient air quality standards
CO	1-hour	4,524.0	4,367.8	8,891.8	40,000.0	Below all ambient air quality standards
	8-hour	4,524.0	1,724.1	6,248.1	10,000.0	Below all ambient air quality standards
SO ₂	1-hour	11.4	7.9	19.3	196.4	Below all ambient air quality standards
	3-hour	11.4	7.9	19.3	700.0 (Colorado) 1,300 (Utah)	Below all ambient air quality standards
NOTES: A factor of 80 percent was applied to estimated nitrogen oxides concentrations for conversion to nitrogen dioxide based on the Environmental Protection Agency's March 1, 2011, memorandum: <i>Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO₂ National Ambient Air Quality Standard</i> CO = Carbon monoxide NO ₂ = Nitrogen dioxide PM _{2.5} = Particulate matter less than 2.5 micrometers PM ₁₀ = Particulate matter less than 10 micrometers SO ₂ = Sulfur dioxide						

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APPENDIX E – BIOLOGICAL RESOURCES SUPPORTING DATA

Information presented in this appendix was compiled to assist in completion of biological resource inventories and impacts analysis included in Chapters 3 and 4.

E.1 Land Cover Categories in the Project Area

Land cover in the Project area was identified using data from the National Land Cover Gap Analysis Project (GAP) dataset (U.S. Geological Survey [USGS] 2010). The National Land Cover GAP dataset is compiled from both the Northwest GAP (University of Idaho 2010) and the Southwest GAP datasets (Lowry et al. 2005).

A total of 86 GAP land cover categories were identified in the Project area (Table E-1). Descriptions of the GAP land cover categories in the Project area were obtained from NatureServe's Ecological System classification descriptions (NatureServe 2012) or the GAP Level Three Land Cover Category Descriptions (University of Idaho 2012). Descriptions of each land cover category are included below Table E-1. Descriptions of altered and disturbed land cover and land use classes (e.g., agriculture, developed, etc.) were adopted from the National Land Cover Dataset 2001 legend (Homer et al. 2004). National Wetlands Inventory (NWI) data (U.S. Fish and Wildlife Service [FWS] 2012a) was used concurrently with GAP data to help identify freshwater wetlands in the wetlands primary vegetation community type. Noxious weed data from Bureau of Land Management (BLM) Field Offices and U.S. Forest Service (USFS) Ranger Districts were also used concurrently with the GAP data to supplement identification of the invasive primary vegetation community type.

For the purposes of this Environmental Impact Statement (EIS), the 86 GAP land cover categories were consolidated and reclassified into 16 primary vegetation communities, also referred to as primary habitat types (Table E-1). This reclassification was done based on similarities of vegetative species composition, structure, and general topographic positioning of certain land cover categories.

TABLE E-1 LAND COVER CATEGORIES IN THE PROJECT AREA	
Primary Vegetation Communities (Reclassification)	Land Cover Categories (Gap Analysis Project or Other)
Agriculture	Cultivated cropland
	Pasture/hay
Alpine	North American alpine ice field
	Rocky Mountain alpine bedrock and scree
	Rocky Mountain alpine dwarf-shrubland
	Rocky Mountain alpine fell-field
	Rocky Mountain alpine-montane wet meadow
	Rocky Mountain dry tundra
Aspen	Inter-Mountain Basins aspen-mixed conifer forest and woodland
	Rocky Mountain aspen forest and woodland

TABLE E-1 LAND COVER CATEGORIES IN THE PROJECT AREA	
Primary Vegetation Communities (Reclassification)	Land Cover Categories (Gap Analysis Project or Other)
Barren/Sparsely Vegetated (less than 10 percent cover)	Colorado Plateau mixed bedrock canyon and tableland
	Inter-Mountain Basins active and stabilized dune
	Inter-Mountain Basins cliff and canyon
	Inter-Mountain Basins playa
	Inter-Mountain Basins shale badland
	Rocky Mountain cliff, canyon and massive bedrock
	Western Great Plains cliff and outcrop
Big Sagebrush	Inter-Mountain Basins big sagebrush shrubland
	Inter-Mountain Basins big sagebrush steppe
	Inter-Mountain Basins montane sagebrush steppe
Developed/Disturbed	Developed, high intensity
	Developed, low intensity
	Developed, medium intensity
	Developed, open space
	Disturbed, non-specific
	Disturbed/successional – recently chained pinyon-juniper
	Quarries, mines, gravel pits and oil wells
	Recently burned
	Recently logged areas
Grassland	Inter-Mountain Basins semi-desert grassland
	Northern Rocky Mountain lower montane, foothill and valley grassland
	Northwestern Great Plains mixed grass prairie
	Rocky Mountain subalpine-montane mesic meadow
	Southern Rocky Mountain montane-subalpine grassland
	Western Great Plains sand prairie
Invasive	Introduced upland vegetation – annual grassland
	Introduced upland vegetation – perennial grassland and forbland
	Introduced upland vegetation – treed
Montane Forest	Middle Rocky Mountain montane Douglas-fir forest and woodland
	Northern Rocky Mountain dry-mesic montane mixed conifer forest
	Northern Rocky Mountain mesic montane mixed conifer forest
	Rocky Mountain lodgepole pine forest
	Rocky Mountain subalpine dry-mesic spruce-fir forest and woodland
	Rocky Mountain subalpine mesic spruce-fir forest and woodland
	Rocky Mountain subalpine-montane limber-bristlecone pine woodland
	Southern Rocky Mountain dry-mesic montane mixed conifer forest and woodland
	Southern Rocky Mountain mesic montane mixed conifer forest and woodland
Mountain Shrub	Harvested forest-shrub regeneration
	Inter-Mountain Basins curl-leaf mountain-mahogany woodland and shrubland
	Northern Rocky Mountain montane-foothill deciduous shrubland
	Northern Rocky Mountain subalpine deciduous shrubland
	Rocky Mountain gambel oak-mixed montane shrubland
	Rocky Mountain lower montane-foothill shrubland

TABLE E-1 LAND COVER CATEGORIES IN THE PROJECT AREA	
Primary Vegetation Communities (Reclassification)	Land Cover Categories (Gap Analysis Project or Other)
Pinyon-Juniper	Colorado Plateau pinyon-juniper shrubland
	Colorado Plateau pinyon-juniper woodland
	Great Basin pinyon-juniper woodland
	Inter-Mountain Basins juniper savanna
	Rocky Mountain foothill limber pine-juniper woodland
	Southern Rocky Mountain pinyon-juniper woodland
Ponderosa Pine	Northern Rocky Mountain foothill conifer wooded steppe
	Southern Rocky Mountain ponderosa pine woodland
Riparian	Great Basin foothill and lower montane riparian woodland and shrubland
	Introduced riparian and wetland vegetation
	Northwestern Great Plains riparian
	Rocky Mountain bigtooth maple ravine woodland
	Rocky Mountain lower montane riparian woodland and shrubland
	Rocky Mountain subalpine-montane riparian shrubland
	Rocky Mountain subalpine-montane riparian woodland
	Western Great Plains floodplain
	Western Great Plains riparian woodland and shrubland
	National Wetlands Inventory data
Shrub/Shrub Steppe	Colorado Plateau blackbrush-mormon-tea shrubland
	Colorado Plateau mixed low sagebrush shrubland
	Great Basin xeric mixed sagebrush shrubland
	Inter-Mountain Basins greasewood flat
	Inter-Mountain Basins mat saltbush shrubland
	Inter-Mountain Basins mixed salt desert scrub
	Inter-Mountain Basins semi-desert shrub steppe
	Southern Colorado Plateau sand shrubland
	Wyoming basins dwarf sagebrush shrubland and steppe
	National Wetlands Inventory data
Water	Open water (fresh)
Wetland	Great Plains prairie pothole
	Inter-Mountain Basins interdunal swale wetland
	North American arid west emergent marsh
	Rocky Mountain subalpine-montane fen
	Western Great Plains closed depression wetland
	Western Great Plains open freshwater depression wetland
	Western Great Plains saline depression wetland
	National Wetlands Inventory data

E.1.1 Agriculture

Cultivated Cropland

Cultivated croplands are areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled (University of Idaho 2012).

Pasture/Hay

Pasture/hay areas include grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation (University of Idaho 2012).

E.1.2 Alpine

North American Alpine Ice Field

This widespread ecological system is composed of unvegetated landscapes of annual/perennial ice and snow and exposed rock and rubble at the highest elevations, where snowfall exceeds melting. The primary ecological processes include snow/ice retention and/or decadal movement (active moraines and till), wind desiccation, and permafrost. The snowpack/ice field never melts or if so, then for only a few weeks. The alpine substrate/ice field ecological system is part of the alpine mosaic consisting of alpine tundra dry meadow, wet meadow, fell-fields, and dwarf-shrubland (University of Idaho 2012).

Rocky Mountain Alpine Bedrock and Scree

This ecological system is restricted to the highest elevations of the Rocky Mountains, from Alberta and British Columbia south into New Mexico, west into the highest mountain ranges of the Great Basin. It is composed of barren and sparsely vegetated alpine substrates, typically including both bedrock outcrop and scree slopes, with nonvascular- (lichen) dominated communities. Exposure to desiccating winds, rocky and sometimes unstable substrates, and a short growing season limit plant growth. There can be sparse cover of forbs, grasses, lichens and low shrubs (NatureServe 2012).

Rocky Mountain Alpine Dwarf-Shrubland

This widespread ecological system occurs above upper timberline throughout the Rocky Mountain cordillera, including alpine areas of ranges in Utah and Nevada, and north into Canada. Elevations are above 11,000 feet (3,360 meters) in the Colorado Rockies but drop to less than 6,900 feet (2,100 meters) in northwestern Montana and in the mountains of Alberta. This system occurs in areas of level or concave glacial topography, with late-lying snow and subirrigation from surrounding slopes. Soils have become relatively stabilized in these sites, are moist but well-drained, strongly acidic, and often with substantial peat layers. Vegetation in these areas is controlled by snow retention, wind desiccation, permafrost, and a short growing season. This ecological system is characterized by a semi-continuous layer of ericaceous dwarf-shrubs or dwarf willows that form a heath type ground cover less than 1.64 feet (0.5 meter) in height. Dense tufts of graminoids and scattered forbs occur. *Dryas octopetala* or *Dryas integrifolia* communities are not included here, except for one very moist association, because they occur on more windswept and drier sites than the heath communities. In these communities *Cassiope mertensiana*, *Salix arctica*, *Salix reticulata*, *Salix vestita*, or *Phyllodoce empetriflora* can be dominant shrubs. *Vaccinium* spp., *Ledum glandulosum*, *Phyllodoce glanduliflora*, and *Kalmia microphylla* may also be shrub associates. The herbaceous layer is a mixture of forbs and graminoids, especially sedges, including, *Erigeron* spp., *Luetkea pectinata*, *Antennaria lanata*, *Oreostemma alpinum* (= *Aster alpinus*), *Pedicularis* spp., *Castilleja* spp., *Deschampsia caespitosa*, *Caltha leptosepala*, *Erythronium* spp., *Juncus parryi*, *Luzula piperi*, *Carex spectabilis*, *Carex nigricans*, and *Polygonum bistortoides*. Fell-fields often intermingle with the alpine dwarf-shrubland (NatureServe 2012).

Rocky Mountain Alpine Fell-Field

This ecological system is found discontinuously at alpine elevations throughout the Rocky Mountains, west into the mountainous areas of the Great Basin, and north into the Canadian Rockies. Small areas are

represented in the west side of the Okanagan Ecoregion in the eastern Cascades. These are wind-scoured fell-fields that are free of snow in the winter, such as ridgetops and exposed saddles, exposing the plants to severe environmental stress. Soils on these windy unproductive sites are shallow, stony, low in organic matter, and poorly developed; wind deflation often results in a gravelly pavement. Most fell-field plants are cushioned or matted, frequently succulent, flat to the ground in rosettes and often densely haired and thickly cutinized. Plant cover is 15 to 50 percent, while exposed rocks make up the rest. Fell-fields are usually in or adjacent to alpine tundra dry meadows. Common species include *Arenaria capillaris*, *Geum rossii*, *Kobresia myosuroides*, *Minuartia obtusiloba*, *Myosotis asiatica*, *Paronychia pulvinata*, *Phlox pulvinata*, *Sibbaldia procumbens*, *Silene acaulis*, *Trifolium dasyphyllum*, and *Trifolium parryi* (NatureServe 2012).

Rocky Mountain Alpine-Montane Wet Meadow

These are high-elevation communities found throughout the Rocky Mountains and Intermountain regions, dominated by herbaceous species found on wetter sites with very low-velocity surface and subsurface flows. They range in elevation from montane to alpine 3,300 to 11,800 feet (1,000 to 3,600 meters). These types occur as large meadows in montane or subalpine valleys, as narrow strips bordering ponds, lakes, and streams, and along toeslope seeps. They are typically found on flat areas or gentle slopes, but may also occur on sub-irrigated sites with slopes up to 10 percent. In alpine regions, sites typically are small depressions located below late-melting snow patches or on snowbeds. Soils of this system may be mineral or organic. In either case, soils show typical hydric soil characteristics, including high organic content and/or low chroma and redoximorphic features. This system often occurs as a mosaic of several plant associations, often dominated by graminoids, including *Calamagrostis stricta*, *Caltha leptosepala*, *Cardamine cordifolia*, *Carex illota*, *Carex microptera*, *Carex nigricans*, *Carex scopulorum*, *Carex utriculata*, *Carex vernacula*, *Deschampsia caespitosa*, *Eleocharis quinqueflora*, *Juncus drummondii*, *Phippsia algida*, *Rorippa alpina*, *Senecio triangularis*, *Trifolium parryi*, and *Trollius laxus*. Often alpine dwarf-shrublands, especially those dominated by *Salix*, are immediately adjacent to the wet meadows. Wet meadows are tightly associated with snowmelt and typically not subjected to high disturbance events such as flooding (NatureServe 2012).

Rocky Mountain Dry Tundra

Alpine turf occurs above upper treeline throughout the Rocky Mountains, including alpine areas in Utah and Nevada. It is found on gentle to moderate slopes, flat ridges, and margins of alpine valleys, where the soil has become relatively stable. These wind-swept sites retain little snow cover and are relatively harsh, dry habitats. The plant cover is a short, often dense, diverse mixture of sod-forming grasses and sedges, and mat-forming herbs (cushion plants). Common plants include blackroot sedge, dry-spike sedge, Scirpus-like sedge, arctic bluegrass, Ross' avens, Pacific bog sedge, cushion phlox, Parry's clover and Uinta clover. Because of the very short growing season, summer flowers are often abundant (University of Idaho 2012).

E.1.3 Aspen

Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland

This ecological system occurs on montane slopes and plateaus in Utah, western Colorado, northern Arizona, eastern Nevada, southern Idaho, western Wyoming, and in north-central Montana in the Big Snowy Mountains. It also occurs in localized settings in the Klamath Mountains of California, as well as in the Sierra Nevada and adjacent Great Basin mountains (Inyo, White, Warner, and Modoc Plateau). Elevations range from 5,600 to 9,200 feet (1,700 to 2,800 meters). Occurrences are typically on gentle to steep slopes on any aspect but are often found on clay-rich soils in intermontane valleys. Soils are derived from alluvium, colluvium and residuum from a variety of parent materials but most typically occur on

sedimentary rocks. The tree canopy is composed of a mix of deciduous and coniferous species, codominated by *Populus tremuloides* and conifers, including *Pseudotsuga menziesii*, *Abies concolor*, *Abies lasiocarpa*, *Abies magnifica*, *Picea engelmannii*, *Picea glauca* X *engelmannii*, *Picea pungens*, *Pinus contorta*, *Pinus flexilis*, *Pinus jeffreyi*, *Pinus contorta* var. *murrayana*, and *Pinus ponderosa*. As the occurrences age, *Populus tremuloides* is slowly reduced until the conifer species become dominant. Common shrubs include *Amelanchier alnifolia*, *Prunus virginiana*, *Acer grandidentatum*, *Symphoricarpos oreophilus*, *Juniperus communis*, *Paxistima myrsinites*, *Rosa woodsii*, *Spiraea betulifolia*, *Symphoricarpos albus*, or *Mahonia repens*. Herbaceous species include *Bromus carinatus*, *Calamagrostis rubescens*, *Carex geyeri*, *Elymus glaucus*, *Poa* spp., and *Achnatherum*, *Hesperostipa*, *Nassella*, and/or *Piptochaetium* spp. (= *Stipa* spp.), *Achillea millefolium*, *Arnica cordifolia*, *Asteraceae* spp., *Erigeron* spp., *Galium boreale*, *Geranium viscosissimum*, *Lathyrus* spp., *Lupinus argenteus*, *Mertensia arizonica*, *Mertensia lanceolata*, *Maianthemum stellatum*, *Osmorhiza berteroi* (= *Osmorhiza chilensis*), and *Thalictrum fendleri*. Most occurrences at present represent a late-seral stage of aspen changing to a pure conifer occurrence. Nearly a hundred years of fire suppression and livestock grazing have converted much of the pure aspen occurrences to the present-day aspen-conifer forest and woodland ecological system. This is the typical meadow edge aspen-conifer setting in the Sierra Nevada where frequently, due to fire suppression, the conifers are replacing aspens (NatureServe 2012).

Rocky Mountain Aspen Forest and Woodland

This widespread ecological system is more common in the southern and central Rocky Mountains but occurs in the montane and subalpine zones throughout much of the western United States and north into Canada. An eastern extension occurs along the Rocky Mountains foothill front and in mountain "islands" in Montana (Big Snowy and Highwood mountains), and the Black Hills of South Dakota. In California, this system is only found on the east side of the Sierra Nevada adjacent to the Great Basin. Large stands are found in the Inyo and White mountains, while small stands occur on the Modoc Plateau. In western Alberta, it occurs only in the Upper Foothills subregion and north of three transitions to Western North American Boreal Mesic Birch-Aspen Forest. Elevations generally range from 5,000 to 10,000 feet (1,525 to 3,050 meters), but occurrences can be found at lower elevations in some regions, especially in the Canadian Rockies. Distribution of this ecological system is primarily limited by adequate soil moisture required to meet its high evapotranspiration demand. Secondly, it is limited by the length of the growing season or low temperatures. These are upland forests and woodlands dominated by *Populus tremuloides* without a significant conifer component (less than 25 percent relative tree cover). The understory structure may be complex with multiple shrub and herbaceous layers, or simple with just an herbaceous layer. The herbaceous layer may be dense or sparse, dominated by graminoids or forbs. In California, *Symphotrichum spathulatum* (= *Aster occidentalis*) is a common forb. Associated shrub species include *Symphoricarpos* spp., *Rubus parviflorus*, *Amelanchier alnifolia*, and *Arctostaphylos uva-ursi*. Occurrences of this system originate and are maintained by stand-replacing disturbances such as avalanches, crown fire, insect outbreak, disease and windthrow, or clearcutting by man or beaver, in the matrix of conifer forests. It differs from Northwestern Great Plains Aspen Forest and Parkland, which is limited to plains environments (NatureServe 2012).

E.1.4 Barren and Sparsely Vegetated

Colorado Plateau Mixed Bedrock Canyon and Tableland

The distribution of this ecological system is centered on the Colorado Plateau where it is comprised of barren and sparsely vegetated landscapes (generally less than 10 percent plant cover) of steep cliff faces, narrow canyons, and open tablelands of predominantly sedimentary rocks, such as sandstone, shale, and limestone. Some eroding shale layers similar to Inter-Mountain Basins Shale Badland may be interbedded between the harder rocks. The vegetation is characterized by very open tree canopy or scattered trees and

shrubs with a sparse herbaceous layer. Common species includes *Pinus edulis*, *Pinus ponderosa*, *Juniperus* spp., *Cercocarpus intricatus*, and other short-shrub and herbaceous species, utilizing moisture from cracks and pockets where soil accumulates (NatureServe 2012).

Inter-Mountain Basins Active and Stabilized Dune

This ecological system occurs in the Intermountain western United States on basins, valleys and plains. Often it is composed of a mosaic of migrating, bare dunes; anchored dunes with sparse to moderately dense vegetation (less than 10 to 30 percent canopy cover); and stabilized dunes. The system is defined by the presence of migrating dunes or, where the dunes are entirely anchored or stabilized, evidence that the substrate is eolian and not residual, that the vegetation is early-seral or mid-seral, and that the substrate is likely to become actively migrating again with disturbance or increased aridity. In the Colorado Plateau, there are many small active and partially vegetated dunes along some of the larger washes and playas (where sand is blown out of wash and forms dunes) and some larger dunes such as Coral Pink Dunes in southwestern Utah. Substrates are usually eolian sand, but small dunes composed of silt and clay downwind from playas in the Wyoming Basins (which usually support greasewood vegetation) also are included here. Species occupying these environments are often adapted to shifting, coarse-textured substrates (usually quartz sand) and form patchy or open grasslands, shrublands or steppe, and occasionally woodlands. Vegetation varies and may be composed of *Achnatherum hymenoides*, *Artemisia filifolia*, *Artemisia tridentata* ssp. *tridentata*, *Atriplex canescens*, *Ephedra* spp., *Chrysothamnus viscidiflorus*, *Coleogyne ramosissima*, *Ericameria nauseosa*, *Hesperostipa comata*, *Leymus flavescens*, *Muhlenbergia pungens*, *Psoralea lanceolata*, *Purshia tridentata*, *Redfieldia flexuosa*, *Sporobolus airoides*, *Sarcobatus vermiculatus*, *Tetradymia tetrameres*, or *Tiquilia* spp. Herbaceous species such as *Achnatherum hymenoides*, *Redfieldia flexuosa*, and *Psoralea lanceolata* are characteristic of early-seral vegetation through much of this system's range. Shrubs are commonly dominant on mid- to late-seral stands, and *Ericameria nauseosa* can be found at any stage (NatureServe 2012).

Inter-Mountain Basins Cliff and Canyon

This ecological system ranges from Wyoming and Utah west to the Pacific states. It is found from foothill to subalpine elevations and includes barren and sparsely vegetated landscapes (generally less than 10 percent plant cover) of steep cliff faces, narrow canyons, and smaller rock outcrops of various igneous, sedimentary, and metamorphic bedrock types. Also included is vegetation of unstable scree and talus slopes that typically occurs below cliff faces. Widely scattered trees and shrubs may include *Abies concolor*, *Pinus edulis*, *Pinus flexilis*, *Pinus monophylla*, *Juniperus* spp., *Artemisia tridentata*, *Purshia tridentata*, *Cercocarpus ledifolius*, *Ephedra* spp., *Holodiscus discolor*, and other species often common in adjacent plant communities (NatureServe 2012).

Inter-Mountain Basins Playa

This ecological system is composed of barren and sparsely vegetated playas (generally less than 10 percent plant cover) found in the Intermountain western United States. Salt crusts are common throughout, with small saltgrass beds in depressions and sparse shrubs around the margins. These systems are intermittently flooded. The water is prevented from percolating through the soil by an impermeable soil subhorizon and is left to evaporate. Soil salinity varies greatly with soil moisture and greatly affects species composition. Characteristic species may include *Allenrolfea occidentalis*, *Sarcobatus vermiculatus*, *Grayia spinosa*, *Puccinellia lemmonii*, *Leymus cinereus*, *Distichlis spicata*, and/or *Atriplex* spp (NatureServe 2012).

Inter-Mountain Basins Shale Badland

This widespread ecological system of the Intermountain western United States is composed of barren and sparsely vegetated substrates (greater than 10 percent plant cover) typically derived from marine shales but also includes substrates derived from siltstones and mudstones (clay). In southern Wyoming, the shales are not marine in origin, but often have bentonite derived from volcanic ash deposition that occurred during several eruptions of the Yellowstone volcanic fields. Landforms are typically rounded hills and plains that form a rolling topography. The harsh soil properties and high rate of erosion and deposition are driving environmental variables supporting sparse dwarf-shrubs, e.g., *Atriplex corrugata*, *Atriplex gardneri*, *Artemisia pedatifida*, and herbaceous vegetation (NatureServe 2012).

Rocky Mountain Cliff, Canyon and Massive Bedrock

This ecological system of barren and sparsely vegetated landscapes (generally greater than 10 percent plant cover) is found from foothill to subalpine elevations on steep cliff faces, narrow canyons, and smaller rock outcrops of various igneous (intrusives), sedimentary, and metamorphic bedrock types. It is located throughout the Rocky Mountains and northeastern Cascade Ranges in North America. Also included are unstable scree and talus slopes that typically occur below cliff faces. In general these are the dry sparsely vegetated places on a landscape. The biota on them reflects what is surrounding them, unless it is an extreme parent material. There may be small patches of dense vegetation, but it typically includes scattered trees and/or shrubs. Characteristic trees includes species from the surrounding landscape, such as *Pseudotsuga menziesii*, *Pinus ponderosa*, *Pinus flexilis*, *Populus tremuloides*, *Abies concolor*, *Abies lasiocarpa*, or *Pinus edulis* and *Juniperus* spp. at lower elevations. There may be scattered shrubs present, such as species of *Holodiscus*, *Ribes*, *Physocarpus*, *Rosa*, *Juniperus*, and *Jamesia americana*, *Mahonia repens*, *Rhus trilobata*, or *Amelanchier alnifolia*. Soil development is limited, as is herbaceous cover (NatureServe 2012).

Western Great Plains Cliff and Outcrop

This system includes cliffs and outcrops throughout the Western Great Plains Division. Substrate can range from sandstone and limestone, which can often form bands in the examples of this system. Vegetation is restricted to shelves, cracks and crevices in the rock. However, this system differs from Western Great Plains Badlands in that often the soil is slightly developed and less erodible, and some grass and shrub species can occur at greater than 10 percent. Common species in this system include short shrubs such as *Rhus trilobata* and *Artemisia longifolia* and mixed grass species such as *Bouteloua curtipendula* and *Bouteloua gracilis* and *Calamovilfa longifolia*. Drought and wind erosion are the most common natural dynamics affecting this system (NatureServe 2012).

E.1.5 Big Sagebrush

Inter-Mountain Basins Big Sagebrush Shrubland

This ecological system occurs throughout much of the western United States, typically in broad basins between mountain ranges, plains and foothills between 4,900 and 7,500 feet (1,500 and 2,300 meters) elevation. Soils are typically deep, well-drained and non-saline. These shrublands are dominated by *Artemisia tridentata* ssp. *tridentata* (not as common in Wyoming or Montana but possibly on stabilized part of Killpecker Dunes in Wyoming) and/or *Artemisia tridentata* ssp. *wyomingensis* (predominant in Wyoming and Montana). Scattered *Juniperus* spp., *Sarcobatus vermiculatus*, and *Atriplex* spp. may be present in some stands. *Ericameria nauseosa*, *Chrysothamnus viscidiflorus*, *Purshia tridentata* (not commonly in Montana or Wyoming), or *Symphoricarpos oreophilus* may codominate disturbed stands (e.g., in burned stands, these may become more predominant). Perennial herbaceous components typically contribute less than 25 percent vegetative cover. Common graminoid species can include *Achnatherum*

hymenoides, *Bouteloua gracilis*, *Elymus lanceolatus*, *Festuca idahoensis* (not in Montana or Wyoming), *Hesperostipa comata*, *Leymus cinereus*, *Pleuraphis jamesii* (not present in northeastern portions of the range), *Pascopyrum smithii*, *Poa secunda*, or *Pseudoroegneria spicata* (not in Wyoming). Some semi-natural communities are included that often originate on abandoned agricultural land or on other disturbed sites. In these locations, *Bromus tectorum* or other annual bromes and invasive weeds can be abundant. Most *Artemisia tridentata* ssp. *wyomingensis* communities in Wyoming are placed in Inter-Mountain Basins Big Sagebrush Steppe; the shrubland system is more restricted in environmental setting than the steppe. Dunes in the Red Desert have areas of large basin big sage with very dense canopies. In Wyoming, this system is likely to only contain *Artemisia tridentata* ssp. *tridentata* (NatureServe 2012).

Inter-Mountain Basins Big Sagebrush Steppe

This widespread matrix-forming ecological system occurs throughout much of the Columbia Plateau and northern Great Basin, east into the Wyoming Basins, central Montana, and north and east onto the western fringe of the Great Plains in Montana and South Dakota. It is found at slightly higher elevations farther south. In central Montana, this system differs slightly, with more summer rain than winter precipitation, more precipitation annually, and it occurs on glaciated landscapes. Soils are typically deep and non-saline, often with a microphytic crust. This shrub-steppe is dominated by perennial grasses and forbs (greater than 25 percent cover) with *Artemisia tridentata* ssp. *tridentata* (this is not at all important in Wyoming occurrences), *Artemisia tridentata* ssp. *xericensis*, *Artemisia tridentata* ssp. *wyomingensis*, *Artemisia tripartita* ssp. *tripartita* (Snake River valley in Wyoming), *Artemisia cana* ssp. *cana*, and/or *Purshia tridentata* dominating or codominating the open to moderately dense (10 to 40 percent cover) shrub layer. *Atriplex confertifolia*, *Chrysothamnus viscidiflorus*, *Ericameria nauseosa*, *Sarcobatus vermiculatus*, *Tetradymia* spp., or *Artemisia frigida* may be common especially in disturbed stands. In Montana and Wyoming, stands are more mesic, with more biomass of grass, have less shrub diversity than stands farther west, and 50 to 90 percent of the occurrences are dominated by *Artemisia tridentata* ssp. *wyomingensis* with *Pascopyrum smithii*. In addition, *Bromus japonicus* and *Bromus tectorum* are indicators of disturbance, and *Bromus tectorum* is typically not as abundant as in the Intermountain West, possibly due to a colder climate. Associated graminoids can include *Achnatherum hymenoides*, *Calamagrostis montanensis*, *Elymus lanceolatus* ssp. *lanceolatus*, *Koeleria macrantha*, *Poa secunda*, *Pascopyrum smithii*, *Hesperostipa comata*, *Nassella viridula*, *Bouteloua gracilis*, and *Pseudoroegneria spicata*. Important rhizomatous species include *Carex filifolia* and *Carex duriuscula*, which are very common and important in the eastern distribution of this system in both Wyoming and Montana. *Festuca idahoensis* is uncommon in this system, although it does occur in areas of higher elevations/precipitation; *Festuca campestris* is also uncommon. In Wyoming, both *Nassella viridula* and *Pseudoroegneria spicata* rarely occur, with the latter typically found in eastern Wyoming on ridgetops and rocky slopes outside of this system. In Montana, there is an absence of *Festuca* spp., except *Vulpia octoflora*. Common forbs are *Phlox hoodii*, *Arenaria* spp., *Opuntia* spp., *Sphaeralcea coccinea*, *Dalea purpurea*, *Liatris punctata*, and *Astragalus* spp. Areas with deeper soils more commonly support *Artemisia tridentata* ssp. *tridentata* but have largely been converted for other land uses. The natural fire regime of this ecological system likely maintains a patchy distribution of shrubs, so the general aspect of the vegetation is grassland. Shrubs may increase following heavy grazing and/or with fire suppression, particularly in moist portions of the northern Columbia Plateau where it forms a landscape mosaic pattern with shallow-soil scabland shrublands. Where fire frequency has allowed for shifts to a native grassland condition, maintained without significant shrub invasion over a 50- to 70-year interval, the area would be considered Columbia Basin Foothill and Canyon Dry Grassland (NatureServe 2012).

Inter-Mountain Basins Montane Sagebrush Steppe

This ecological system includes sagebrush communities occurring at foothills (in Wyoming) to montane and subalpine elevations across the western United States from 3,300 feet (1,000 meters) in eastern

Oregon and Washington to over 9,800 feet (3,000 meters) in the southern Rockies. In Montana, it occurs on mountain "islands" in the north-central portion of the state and possibly along the Boulder River south of Absarokee and at higher elevations. In British Columbia, it occurs between 1,450 and 5,400 feet (450 and 1,650 meters) in the southern Fraser Plateau and the Thompson and Okanagan basins. Climate is cool, semi-arid to subhumid. This system primarily occurs on deep-soiled to stony flats, ridges, nearly flat ridgetops, and mountain slopes. In general, this system shows an affinity for mild topography, fine soils, some source of subsurface moisture or more mesic sites, zones of higher precipitation and areas of snow accumulation. Across its range of distribution, this is a compositionally diverse system. It is composed primarily of *Artemisia tridentata* ssp. *vaseyana*, *Artemisia cana* ssp. *viscidula*, and related taxa such as *Artemisia tridentata* ssp. *spiciformis* (= *Artemisia spiciformis*). *Purshia tridentata* may codominate or even dominate some stands. *Artemisia arbuscula* ssp. *arbuscula*-dominated shrublands commonly occur in this system on rocky or windblown sites. Other common shrubs include *Symphoricarpos* spp., *Amelanchier* spp., *Ericameria nauseosa*, *Peraphyllum ramosissimum*, *Ribes cereum*, and *Chrysothamnus viscidiflorus*. *Artemisia tridentata* ssp. *wyomingensis* may be present to codominant if the stand is clearly montane as indicated by montane indicator species such as *Festuca idahoensis*, *Leucopoa kingii*, or *Danthonia intermedia*. Most stands have an abundant perennial herbaceous layer (over 25 percent cover, in many cases over 50 percent cover), but this system also includes *Artemisia tridentata* ssp. *vaseyana* shrublands. Common graminoids include *Danthonia intermedia*, *Festuca arizonica*, *Festuca idahoensis*, *Hesperostipa comata*, *Poa fendleriana*, *Elymus trachycaulus*, *Bromus carinatus*, *Poa secunda*, *Leucopoa kingii*, *Deschampsia caespitosa*, *Calamagrostis rubescens*, and *Pseudoroegneria spicata*. Species of *Achnatherum* are common, including *Achnatherum nelsonii* ssp. *dorei*, *Achnatherum nelsonii* ssp. *nelsonii*, *Achnatherum hymenoides*, and others. In many areas, wildfires can maintain an open herbaceous-rich steppe condition, although at most sites, shrub cover can be unusually high for a steppe system (greater than 40 percent), with the moisture providing equally high grass and forb cover (NatureServe 2012).

E.1.6 Developed/Disturbed

Developed, High Intensity

This land cover category includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100 percent of the total cover (University of Idaho 2012).

Developed, Low Intensity

This land cover category includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20 to 49 percent of total cover. These areas most commonly include single-family housing units (University of Idaho 2012).

Developed, Medium Intensity

This land cover category includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50 to 79 percent of the total cover. These areas most commonly include single-family housing units (University of Idaho 2012).

Developed, Open Space

This land cover category includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and

vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes (University of Idaho 2012).

Disturbed, Non-specific

This land cover category includes areas that are barren or have relatively low vegetation cover that is associated with some form of generic human alteration or management regime. These areas are typically associated with heavy amounts of grazing (University of Idaho 2012).

Disturbed/Successional – Recently Chained Pinyon-Juniper

This land cover category includes areas that have recently been chained to remove Pinyon-Juniper and are clearly evident in the imagery (images acquired between 1999 and 2001) (University of Idaho 2012).

Quarries, Mines, Gravel Pits and Oil Wells

This land cover category includes areas of extractive mining activities with significant surface expression (University of Idaho 2012).

Recently Burned

This land cover category includes areas that have burned in the recent past that are clearly evident in the imagery (images acquired between 1999 and 2001) (University of Idaho 2012).

Recently Logged Areas

This land cover category includes areas that have recently been clear-cut or thinned by 50 percent or more and are clearly evident in the imagery (images acquired between 1999 and 2001) (University of Idaho 2012).

E.1.7 Grassland

Inter-Mountain Basins Semi-Desert Grassland

This widespread ecological system includes the driest grasslands throughout the Intermountain western United States. It occurs on xeric sites over an elevation range of approximately 4,750 to 7,610 feet (1,450 to 2,320 meters) on a variety of landforms, including swales, playas, mesas, alluvial flats, and plains. This system may constitute the matrix over large areas of Intermountain basins, and also may occur as large patches in mosaics with shrubland systems dominated by *Artemisia tridentata* ssp. *tridentata*, *Artemisia tridentata* ssp. *wyomingensis*, *Atriplex* spp., *Coleogyne* spp., *Ephedra* spp., *Gutierrezia sarothrae*, or *Krascheninnikovia lanata*. Grasslands in areas of higher precipitation, at higher elevation, typically belong to other systems. Substrates are often well-drained sandy or loam soils derived from sedimentary parent materials but are quite variable and may include fine-textured soils derived from igneous and metamorphic rocks. The dominant perennial bunch grasses and shrubs in this system are all drought-resistant plants. Dominant or codominant species are *Achnatherum hymenoides*, *Aristida* spp., *Bouteloua gracilis*, *Hesperostipa comata*, *Muhlenbergia* spp., or *Pleuraphis jamesii*. Scattered shrubs and dwarf-shrubs often are present, especially *Artemisia tridentata* ssp. *tridentata*, *Artemisia tridentata* ssp. *wyomingensis*, *Atriplex* spp., *Coleogyne* spp., *Ephedra* spp., *Gutierrezia sarothrae*, and *Krascheninnikovia lanata*. Grasslands in the basins of south-central and southwestern Wyoming, dominated by *Pseudoroegneria spicata* and *Poa secunda* and containing cushion-form forbs and other species typical of dry basins, are included in this system (NatureServe 2012).

Northern Rocky Mountain Lower Montane, Foothill and Valley Grassland

This ecological system of the northern Rocky Mountains is found at lower montane to foothill elevations in the mountains and large valleys of northeastern Wyoming and western Montana, west through Idaho into the Blue Mountains of Oregon, and north into the Okanagan and Fraser plateaus of British Columbia and the Canadian Rockies. They also occur to the east in the central Montana mountain "islands," foothills, as well as the Rocky Mountain Front and Big and Little Belt ranges. These grasslands are floristically similar to Inter-Mountain Basins Big Sagebrush Steppe, Columbia Basin Foothill and Canyon Dry Grassland, and Columbia Basin Palouse Prairie, but are defined by shorter summers, colder winters, and young soils derived from recent glacial and alluvial material. These northern lower montane and valley grasslands represent a shift in the precipitation regime from summer monsoons and cold snowy winters found in the southern Rockies to predominantly dry summers and winter precipitation. In the eastern portion of its range in Montana, winter precipitation is replaced by a huge spring peak in precipitation. They are found at elevations from 980 to 5,400 feet (300 to 1,650 meters), ranging from small meadows to large open parks surrounded by conifers in the lower montane, to extensive foothill and valley grasslands below the lower treeline. Many of these valleys may have been primarily sage-steppe with patches of grassland in the past, but because of land-use history post-settlement (herbicide, grazing, fire suppression, pasturing, etc.), they have been converted to grassland-dominated areas. Soils are relatively deep, fine-textured, often with coarse fragments, and non-saline, often with a microphytic crust. The most important species are cool-season perennial bunch grasses and forbs (greater than 25 percent cover), sometimes with a sparse (less than 10 percent cover) shrub layer. *Pseudoroegneria spicata*, *Festuca campestris*, *Festuca idahoensis*, or *Hesperostipa comata* commonly dominate sites on all aspects of level to moderate slopes and on certain steep slopes with a variety of other grasses, such as *Achnatherum hymenoides*, *Achnatherum richardsonii*, *Hesperostipa curtisetia*, *Koeleria macrantha*, *Leymus cinereus*, *Elymus trachycaulus*, *Bromus inermis* ssp. *pumpellianus* (= *Bromus pumpellianus*), *Achnatherum occidentale* (= *Stipa occidentalis*), *Pascopyrum smithii*, and other graminoids such as *Carex filifolia* and *Danthonia intermedia*. Other grassland species include *Opuntia fragilis*, *Artemisia frigida*, *Carex petasata*, *Antennaria* spp., and *Selaginella densa*. Important exotic grasses include *Phleum pratense*, *Bromus inermis*, and *Poa pratensis*. Shrub species may be scattered, including *Amelanchier alnifolia*, *Rosa* spp., *Symphoricarpos* spp., *Juniperus communis*, *Artemisia tridentata*, and in Wyoming *Artemisia tripartita* ssp. *rupicola*. Common associated forbs include *Geum triflorum*, *Galium boreale*, *Campanula rotundifolia*, *Antennaria microphylla*, *Geranium viscosissimum*, and *Potentilla gracilis*. A soil crust of lichen covers almost all open soil between clumps of grasses; *Cladonia* and *Peltigera* are the most common lichens. Unvegetated mineral soil is commonly found between clumps of grass and the lichen cover. The fire regime of this ecological system maintains a grassland due to rapid fire return that retards shrub invasion or landscape isolation and fragmentation that limits seed dispersal of native shrub species. Fire frequency is presumed to be less than 20 years. These are extensive grasslands, not grass-dominated patches in the sagebrush shrub steppe ecological system. *Festuca campestris* is easily eliminated by grazing and does not occur in all areas of this system (NatureServe 2012).

Northwestern Great Plains Mixed Grass Prairie

This system extends from northern Nebraska into southern Canada and westward through the Dakotas to the Rocky Mountain Front in Montana and probably Wyoming, on both glaciated and non-glaciated substrates. Soil texture (which ultimately effects water available to plants) is the defining environmental descriptor; soils are primarily fine and medium-textured and do not include sands, sandy soils, or sandy loams. This system occurs on a wide variety of landforms (e.g., mesatops, stream terraces) and in proximity to a diversity of other systems. Most usually it is found in association with Western Great Plains Sand Prairie that occupies the coarser-textured substrates. In various locales the topography where this system occurs is broken by many glacial pothole lakes, and this system may be proximate to Great Plains Prairie Pothole. On the eastern Montana plains, mixedgrass prairie is by far the predominant

system. Here it occurs continuously for hundreds of square kilometers, interrupted only by riparian areas or sand prairies, which are associated with gentle rises, eroded ridges or mesas derived from sandstone. Historically, this system covered approximately 38 million hectare in Nebraska, North and South Dakota, and Canada; now it covers approximately 270,000 square kilometers in this region. The growing season and rainfall are intermediate to drier units to the southwest and mesic tallgrass regions to the east. Graminoids typically comprising the greatest canopy cover include *Pascopyrum smithii*, *Nassella viridula*, and *Festuca* spp. In Montana these include *Festuca campestris* and *Festuca idahoensis*. Other commonly dominant species in Montana are *Bouteloua gracilis*, *Hesperostipa comata*, and *Carex filifolia*, while *Festuca campestris* and *Festuca idahoensis* may be more abundant in the north and foothill/montane grassland transition areas. Remnants of *Hesperostipa curtisetia*-dominated vegetation are found in northernmost Montana and North Dakota associated with the most productive sites (largely plowed to cereal grains); the species, usually in association with *Pascopyrum smithii*, is much more abundant in Canada. Sites with a strong component of *Nassella viridula* indicate a more favorable moisture balance and perhaps a favorable grazing regime as well because this is one of the most palatable of the mid-grasses. *Hesperostipa comata* is also an important component and becomes increasingly so as improper grazing regimes favor it at the expense of (usually) *Pascopyrum smithii*; progressively more destructive grazing can result in the loss of *Pascopyrum smithii* from the system followed by drastic reduction in *Hesperostipa comata* and ultimately the dominance of *Bouteloua gracilis* (or *Poa secunda* and other short graminoids) and/or a lawn of *Selaginella densa*. *Koeleria macrantha*, at least in Montana and southern Canada, is the most pervasive grass; if it has high cover, past intensive grazing is the presumed reason. Shrub species such as *Symphoricarpos* spp. and *Artemisia frigida* and *Artemisia cana* also occur. Fire and grazing constitute the primary dynamics affecting this system. Drought can also impact this system, in general favoring the shortgrass component at the expense of the mid-grasses. With intensive grazing, cool-season exotics such as *Poa pratensis*, *Bromus inermis*, and *Bromus japonicus* can increase in dominance; both of the rhizomatous grasses have been shown to markedly depress species diversity. Shrub species such as *Juniperus virginiana* can also increase in dominance with fire suppression. This system is one of the most disturbed grassland systems in Nebraska, North and South Dakota, and Canada (NatureServe 2012).

Rocky Mountain Subalpine-Montane Mesic Meadow

This Rocky Mountain ecological system is restricted to sites from lower montane to subalpine where finely textured soils, snow deposition, or windswept dry conditions limit tree establishment. Many occurrences are small patch in spatial character, and are often found in mosaics with woodlands, more dense shrublands, or just below alpine communities. It is typically found above 6,500 feet (2,000 meters) in elevation in the southern part of its range and above 1,950 feet (600 meters) in the northern part. These upland communities occur on gentle to moderate-gradient slopes and relatively moist habitats. The soils are typically seasonally moist to saturated in the spring, but if so will dry out later in the growing season. These sites are not as wet as those found in Rocky Mountain Alpine-Montane Wet Meadow. Vegetation is typically forb-rich, with forbs often contributing more to overall herbaceous cover than graminoids. Some stands are comprised of dense grasslands, these often being taxa with relatively broad and soft blades, but where the moist habitat promotes a rich forb component. Important taxa include *Erigeron* spp., *Asteraceae* spp., *Mertensia* spp., *Penstemon* spp., *Campanula* spp., *Lupinus* spp., *Solidago* spp., *Ligusticum* spp., *Thalictrum occidentale*, *Valeriana sitchensis*, *Rudbeckia occidentalis*, *Balsamorhiza sagittata*, and *Wyethia* spp. Important grasses include *Deschampsia caespitosa*, *Koeleria macrantha*, perennial *Bromus* spp., and a number of *Carex* species. *Dasiphora fruticosa* ssp. *floribunda* and *Symphoricarpos* spp. are occasional but not abundant. Burrowing mammals can increase the forb diversity (NatureServe 2012).

Southern Rocky Mountain Montane-Subalpine Grassland

This Rocky Mountain ecological system typically occurs between 7,200 and 9,850 feet (2,200 and 3,000 meters) elevation on flat to rolling plains and parks or on lower sideslopes that are dry, but it may extend up to 11,000 feet (3,350 meters) on warm aspects. Soils resemble prairie soils in that the A-horizon is dark brown, relatively high in organic matter, slightly acidic, and usually well-drained. An occurrence usually consists of a mosaic of two or three plant associations with one of the following dominant bunch grasses: *Danthonia intermedia*, *Danthonia parryi*, *Festuca idahoensis*, *Festuca arizonica*, *Festuca thurberi*, *Muhlenbergia filiculmis*, or *Pseudoroegneria spicata*. The subdominants include *Muhlenbergia montana*, *Bouteloua gracilis*, and *Poa secunda*. These large-patch grasslands are intermixed with matrix stands of spruce-fir, lodgepole pine, ponderosa pine, and aspen forests. In limited circumstances (e.g., South Park in Colorado), they form the "matrix" of high-elevation plateaus. Small-patch representations of this system do occur at high elevations of the Trans-Pecos where they present as occurrences of *Festuca arizonica*-*Blepharoneuron tricholepis* Herbaceous Vegetation. These occurrences often occupy sites adjacent to Madrean Oriental Chaparral (NatureServe 2012).

Western Great Plains Sand Prairie

The sand prairies constitute a very unique system in the western Great Plains. These sand prairies are often considered part of the tallgrass or mixedgrass regions in the western Great Plains but can contain elements from Western Great Plains Shortgrass Prairie, Central Mixedgrass Prairie, and Northwestern Great Plains Mixedgrass Prairie. The largest expanse of sand prairies (approximately 5 million hectares) can be found in the Sandhills of north-central Nebraska and southwestern South Dakota. These areas are relatively intact. The primary use of this system has been grazing (not cultivation), and areas such as the Nebraska Sandhills can experience less degeneration than other prairie systems. Although greater than 90 percent of the Sandhills region is privately owned, the known fragility of the soils and the cautions used by ranchers to avoid poor grazing practices have allowed for fewer significant changes in the vegetation of the Sandhills compared to other grassland systems. The unifying and controlling feature for this system is that coarse-textured soils predominate and the dominant grasses are well-adapted to this condition. Soils in the sand prairies can be relatively undeveloped and are highly permeable. Soil texture and drainage along with a species' rooting morphology, photosynthetic physiology, and mechanisms to avoid transpiration loss are highly important in determining the composition of the sand prairies. In the northwestern portion of its range, stand size corresponds to the area of exposed caprock sandstone, and small patches predominate, but large patches are also found embedded in the encompassing Northwestern Great Plains Mixedgrass Prairie. Another important feature is their susceptibility to wind erosion. Blowouts and sand draws are some of the unique wind-driven disturbances in the sand prairies, particularly the Nebraska Sandhills. In most of eastern Montana, substrates supporting this system have weathered in place from sandstone caprock; thus the solum is relatively thin, and the wind-sculpted features present further east, particularly in Nebraska, do not develop. Graminoid species dominate the sand prairies, although relative dominance can change due to impacts of wind disturbance. *Andropogon hallii* and *Calamovilfa longifolia* are the most common species, but other grass and forb species such as *Hesperostipa comata*, *Carex inops* ssp. *heliophila*, and *Panicum virgatum* may be present. Apparently only *Calamovilfa longifolia* functions as a dominant throughout the range of the system. In the western extent, *Hesperostipa comata* becomes more dominant, and *Andropogon hallii* is less abundant but still present. Communities of *Artemisia cana* ssp. *cana* are included here in central and eastern Montana. Patches of *Quercus havardii* can also occur in this system in the southern Great Plains. Fire and grazing constitute the other major dynamic processes that can influence this system (NatureServe 2012).

E.1.8 Invasive

Introduced Upland Vegetation – Annual Grassland

This land cover category includes areas that are dominated by introduced annual and/or biennial forb species such as: *Halogeton glomeratum*, *Kochia scoparia*, *Salsola* spp., or annual grass species such as: *Avena* spp., *Bromus* spp., *Schismus* spp. (University of Idaho 2012).

Introduced Upland Vegetation – Perennial Grassland and Forbland

This land cover category includes areas that are dominated by introduced perennial forb or grassland species such as: *Cirsium arvense*, *C. vulgare*, *Centaurea* spp., *Euphorbia esula*, *Isatis tinctora*, *Lepidium* spp., *Melilotus albus*, *M. officinalis*, *Onopordum acanthium*, *Agropyron cristatum*, *Bromus inermis*, *Eragrostis lehmannianna*, *Pennisetum* spp., *Poa bulbosa*, *P. pratensis*, *Thinopyrum intermedium* (University of Idaho 2012).

Introduced Upland Vegetation – Treed

This land cover category includes vegetation dominated (typically greater than 60 percent canopy cover) by introduced species. These are spontaneous, self-perpetuating, and not (immediately) the result of planting, cultivation, or human maintenance. Land occupied by introduced vegetation is generally permanently altered (converted) unless restoration efforts are undertaken. Specifically, land cover is significantly altered/disturbed by introduced tree species (University of Idaho 2012).

Noxious Weeds

In addition to the GAP land cover categories used to define invasive habitat in the Project area, noxious weed distribution information was obtained from BLM field offices and USFS ranger districts and was used in conjunction with the GAP data to supplement identification of the invasive primary habitat type to determine the presence of noxious weeds in the Project area.

E.1.9 Montane Forest

Middle Rocky Mountain Montane Douglas-fir Forest and Woodland

This ecological system occurs throughout the middle Rocky Mountains of central and southern Idaho (Lemhi, Beaverhead and Lost River ranges), south and east into the greater Yellowstone region, and south and east into the Wind River, Gros Ventre and Bighorn ranges of Wyoming. It extends north into Montana on the east side of the Continental Divide, north to about the McDonald Pass area, and also into the Rocky Mountain Front region of Montana. This is a *Pseudotsuga menziesii*-dominated system without the maritime floristic composition; these are forests and woodlands occurring in the central Rockies where the southern monsoon influence is less and maritime climate regime is not important. This system includes extensive *Pseudotsuga menziesii* forests, occasionally with *Pinus flexilis* on calcareous substrates, and *Pinus contorta* at higher elevations. True firs, such as *Abies concolor*, *Abies grandis*, and *Abies lasiocarpa*, are absent in these occurrences, but *Picea engelmannii* can occur in some stands. Understory components include shrubs such as *Physocarpus malvaceus*, *Juniperus communis*, *Symphoricarpos oreophilus*, and *Mahonia repens*, and graminoids such as *Calamagrostis rubescens*, *Carex rossii*, and *Leucopoa kingii*. The fire regime is of mixed severity with moderate frequency. This system often occurs at the lower treeline immediately above valley grasslands, or sagebrush steppe and shrublands. Sometimes there may be a "bath-tub ring" of *Pinus ponderosa* at lower elevations or *Pinus flexilis* between the valley non-forested and the solid *Pseudotsuga menziesii* forest. In the Wyoming Basins, this system occurs as isolated stands of *Pseudotsuga menziesii*, with *Artemisia tridentata*, *Pseudoroegneria spicata*, *Leucopoa kingii*, and *Carex rossii* (NatureServe 2012).

Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest

This ecological system is composed of highly variable montane coniferous forests found in the interior Pacific Northwest, from southernmost interior British Columbia, eastern Washington, eastern Oregon, northern Idaho, western and north-central Montana, and south along the east slope of the Cascades in Washington and Oregon. In central Montana it occurs on mountain islands (the Snowy Mountains). This system is associated with a submesic climate regime with annual precipitation ranging from 20 to 40 inches (50 to 100 centimeters), with a maximum in winter or late spring. Winter snowpacks typically melt off in early spring at lower elevations. Elevations range from 1,500 to 6,300 feet (460 to 1,920 meters). Most occurrences of this system are dominated by a mix of *Pseudotsuga menziesii* and *Pinus ponderosa* (but there can be one without the other) and other typically seral species, including *Pinus contorta*, *Pinus monticola* (not in central Montana), and *Larix occidentalis* (not in central Montana). *Picea engelmannii* (or *Picea glauca* or their hybrid) becomes increasingly common towards the eastern edge of the range. The nature of this forest system is a matrix of large patches dominated or codominated by one or combinations of the above species; *Abies grandis* (a fire-sensitive, shade-tolerant species not occurring in central Montana) has increased on many sites once dominated by *Pseudotsuga menziesii* and *Pinus ponderosa*, which were formerly maintained by low-severity wildfire. Presettlement fire regimes may have been characterized by frequent, low-intensity ground fires that maintained relatively open stands of a mix of fire-resistant species. Under present conditions the fire regime is mixed severity and more variable, with stand-replacing fires more common, and the forests are more homogeneous. With vigorous fire suppression, longer fire-return intervals are now the rule, and multi-layered stands of *Pseudotsuga menziesii*, *Pinus ponderosa*, and/or *Abies grandis* provide fuel "ladders," making these forests more susceptible to high-intensity, stand-replacing fires. They are very productive forests that have been priorities for timber production. They rarely form either upper or lower timberline forests. Understories are dominated by graminoids, such as *Pseudoroegneria spicata*, *Calamagrostis rubescens*, *Carex geyeri*, and *Carex rossii* that may be associated with a variety of shrubs, such as *Acer glabrum*, *Juniperus communis*, *Physocarpus malvaceus*, *Symphoricarpos albus*, *Spiraea betulifolia*, or *Vaccinium membranaceum* on mesic sites. *Abies concolor* and *Abies grandis* x *concolor* hybrids in central Idaho (the Salmon Mountains) are included here but have very restricted range in this area. *Abies concolor* and *Abies grandis* in the Blue Mountains of Oregon are probably hybrids of the two and mostly *Abies grandis* (NatureServe 2012).

Northern Rocky Mountain Mesic Montane Mixed Conifer Forest

This ecological system occurs in the northern Rockies of western Montana west into northeastern Washington and southern British Columbia. These are vegetation types dominated by *Tsuga heterophylla* and *Thuja plicata* in most cases, found in areas influenced by incursions of mild, wet, Pacific maritime air masses. Much of the annual precipitation occurs as rain, but where snow does occur, it can generally be melted by rain during warm winter storms. Occurrences generally are found on all slopes and aspects but grow best on sites with high soil moisture, such as toeslopes and bottomlands. At the periphery of its distribution, this system is confined to moist canyons and cooler, moister aspects. Generally these are moist, non-flooded or upland sites that are not saturated yearlong. Along with *Tsuga heterophylla* and *Thuja plicata*, *Pseudotsuga menziesii* commonly shares the canopy, and *Pinus monticola*, *Pinus contorta*, *Abies grandis*, *Taxus brevifolia*, and *Larix occidentalis* are major associates. Mesic *Abies grandis* associations are included in this system, and *Abies grandis* is often the dominant in these situations; *Tsuga heterophylla* and *Thuja plicata* can both be absent. *Cornus nuttallii* may be present in some situations. *Picea engelmannii*, *Abies lasiocarpa*, and *Pinus ponderosa* may be present but only on the coldest or warmest and driest sites. *Linnaea borealis*, *Paxistima myrsinites*, *Alnus incana*, *Acer glabrum*, *Spiraea betulifolia*, *Symphoricarpos hesperius* (= *Symphoricarpos mollis* ssp. *hesperius*), *Cornus canadensis*, *Rubus parviflorus*, *Menziesia ferruginea*, and *Vaccinium membranaceum* are common shrub species. The composition of the herbaceous layer reflects local climate and degree of canopy closure; it is

typically highly diverse in all but closed-canopy conditions. Important forbs and ferns include *Actaea rubra*, *Anemone piperi*, *Aralia nudicaulis*, *Asarum caudatum*, *Clintonia uniflora*, *Coptis occidentalis*, *Thalictrum occidentale*, *Tiarella trifoliata*, *Trientalis borealis*, *Trillium ovatum*, *Viola glabella*, *Gymnocarpium dryopteris*, *Polystichum munitum*, and *Adiantum pedatum*. Typically, stand-replacement, fire-return intervals are from 150 to 500 years, with moderate-severity fire intervals from 50 to 100 years (NatureServe 2012).

Rocky Mountain Lodgepole Pine Forest

This ecological system is widespread in upper montane to subalpine elevations of the Rocky Mountains, Intermountain West region, north into the Canadian Rockies and east into mountain "islands" of north-central Montana. These are subalpine forests where the dominance of *Pinus contorta* is related to fire history and topo-edaphic conditions. Following stand-replacing fires, *Pinus contorta* will rapidly colonize and develop into dense, even-aged stands. Most forests in this ecological system occur as early- to mid-successional forests that developed following fires. This system includes *Pinus contorta*-dominated stands that, while typically persistent for greater than 100-year time frames, may succeed to spruce-fir; in the southern and central Rocky Mountains it is seral to Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland. More northern occurrences are seral to Rocky Mountain Subalpine Mesic-Wet Spruce-Fir Forest and Woodland. Soils supporting these forests are typically well-drained, gravelly, coarse-textured, acidic, and rarely formed from calcareous parent materials. These forests are dominated by *Pinus contorta* with shrub, grass, or barren understories. Sometimes there are intermingled mixed conifer/*Populus tremuloides* stands, with the latter occurring with inclusions of deeper, typically fine-textured soils. The shrub stratum may be conspicuous to absent; common species include *Arctostaphylos uva-ursi*, *Ceanothus velutinus*, *Linnaea borealis*, *Mahonia repens*, *Menziesia ferruginea* (in northern occurrences), *Purshia tridentata*, *Rhododendron albiflorum* (in northern occurrences), *Spiraea betulifolia*, *Spiraea douglasii*, *Shepherdia canadensis*, *Vaccinium caespitosum*, *Vaccinium scoparium*, *Vaccinium membranaceum*, *Symphoricarpos albus*, and *Ribes* spp. In southern interior British Columbia, this system is usually an open lodgepole pine forest found extensively between 1,640 and 5,250 feet (500 and 1,600 meters) elevation in the Columbia Range. In the Interior Cedar Hemlock and Interior Douglas-fir zones, *Tsuga heterophylla* or *Pseudotsuga menziesii* may be present. In Alberta, species composition indicates the transition to more boreal floristics, including such species as *Empetrum nigrum*, *Ledum groenlandicum*, *Leymus innovatus*, and more abundant lichens or mosses such as *Cladina* spp., *Hylocomium splendens*, and *Pleurozium schreberi* (NatureServe 2012).

Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland

Engelmann spruce and subalpine fir forests comprise a substantial part of the subalpine forests of the Cascades and Rocky Mountains from southern British Columbia east into Alberta, and south into New Mexico and the Intermountain region. They also occur on mountain "islands" of north-central Montana. They are the matrix forests of the subalpine zone, with elevations ranging from 4,100 feet (1,275 meters) in its northern distribution to 11,000 feet (3,355 meters) in the south. They often represent the highest elevation forests in an area. Sites in this system are cold year-round, and precipitation is predominantly in the form of snow, which may persist until late summer. Snowpacks are deep and late-lying, and summers are cool. Frost is possible almost all summer and may be common in restricted topographic basins and benches. Despite their wide distribution, the tree canopy characteristics are remarkably similar, with *Picea engelmannii* and *Abies lasiocarpa* dominating either mixed or alone. *Pseudotsuga menziesii* may persist in occurrences of this system for long periods without regeneration. *Pinus contorta* is common in many occurrences, and patches of pure *Pinus contorta* are not uncommon, as well as mixed conifer/*Populus tremuloides* stands. In some areas, such as Wyoming, *Picea engelmannii*-dominated forests are on limestone or dolomite, while nearby codominated spruce-fir forests are on granitic or volcanic rocks. Upper elevation examples may have more woodland physiognomy, and *Pinus albicaulis*

can be a seral component. What have been called "ribbon forests" or "tree islands" by some authors are included here; they can be found at upper treeline in many areas of the Rockies, including the central and northern ranges in Colorado and the Medicine Bow and Bighorn ranges of Wyoming. These are more typically islands or ribbons of trees, sometimes with a krummholz form, with open-meadow areas in a mosaic. These patterns are controlled by snow deposition and wind-blown ice. Xeric species may include *Juniperus communis*, *Linnaea borealis*, *Mahonia repens*, or *Vaccinium scoparium*. In the Bighorn Mountains, *Artemisia tridentata* is a common shrub. More northern occurrences often have taller, more mesic shrub and herbaceous species, such as *Empetrum nigrum*, *Rhododendron albiflorum*, and *Vaccinium membranaceum*. Disturbance includes occasional blowdown, insect outbreaks and stand-replacing fire. Mean return interval for stand-replacing fire is 222 years as estimated in southeastern British Columbia (NatureServe 2012).

Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland

Engelmann spruce and subalpine fir forests comprise a substantial part of the subalpine forests of the Cascades and Rocky Mountains from southern British Columbia east into Alberta, south into New Mexico and the Intermountain region. They are the matrix forests of the subalpine zone, with elevations ranging from 4,100 feet (1,275 meters) in its northern distribution to 11,000 feet (3,355 meters) in the south. They often represent the highest elevation forests in an area. Sites in this system are cold year-round, and precipitation is predominantly in the form of snow, which may persist until late summer. Snowpacks are deep and late-lying, and summers are cool. Frost is possible almost all summer and may be common in restricted topographic basins and benches. Despite their wide distribution, the tree canopy characteristics are remarkably similar, with *Picea engelmannii* and *Abies lasiocarpa* dominating either mixed or alone. *Pseudotsuga menziesii* may persist in occurrences of this system for long periods without regeneration. *Pinus contorta* is common in many occurrences, and patches of pure *Pinus contorta* are not uncommon, as well as mixed conifer/*Populus tremuloides* stands. In some areas, such as Wyoming, *Picea engelmannii*-dominated forests are on limestone or dolomite, while nearby codominated spruce-fir forests are on granitic or volcanic rocks. Xeric species may include *Juniperus communis*, *Linnaea borealis*, *Mahonia repens*, or *Vaccinium scoparium*. More northern occurrences often have taller, more mesic shrub and herbaceous species, such as *Empetrum nigrum*, *Rhododendron albiflorum*, and *Vaccinium membranaceum*. Disturbance includes occasional blow-down, insect outbreaks and stand-replacing fire (University of Idaho 2012).

Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland

This ecological system occurs throughout the Rocky Mountains, south of Montana, on dry, rocky ridges and slopes near upper treeline above the matrix spruce-fir forest. It extends down to the lower montane in the northeastern Great Basin Mountains where dominated by *Pinus flexilis*. Sites are harsh, exposed to desiccating winds, with rocky substrates and a short growing season that limit plant growth. Higher-elevation occurrences are found well into the subalpine-alpine transition on wind-blasted, mostly west-facing slopes and exposed ridges. Calcareous substrates are important for *Pinus flexilis*-dominated communities in the northern Rocky Mountains and possibly elsewhere. The open tree canopy is often patchy and is strongly dominated by *Pinus flexilis* or *Pinus aristata* with the latter restricted to southern Colorado, northern New Mexico and the San Francisco Mountains in Arizona. In the Wyoming Rockies and northern Great Basin, *Pinus albicaulis* is found in some occurrences, but is a minor component. Other trees such as *Juniperus* spp., *Pinus contorta*, *Pinus ponderosa*, or *Pseudotsuga menziesii* are occasionally present. *Arctostaphylos uva-ursi*, *Cercocarpus ledifolius*, *Juniperus communis*, *Mahonia repens*, *Purshia tridentata*, *Ribes montigenum*, or *Vaccinium* spp. may form an open shrub layer in some stands. The herbaceous layer, if present, is generally sparse and composed of xeric graminoids, such as *Calamagrostis purpurascens*, *Festuca arizonica*, *Festuca idahoensis*, *Festuca thurberi*, or *Pseudoroegneria spicata*, or more alpine plants (NatureServe 2012).

Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland

This is a highly variable ecological system of the montane zone of the Rocky Mountains. It occurs throughout the southern Rockies, north and west into Utah, Nevada, Wyoming and Idaho. These are mixed-conifer forests occurring on all aspects at elevations ranging from 3,900 to 10,825 feet (1,200 to 3,300 meters). Rainfall averages less than 29.5 inches (75 centimeters) per year (16 to 24 inches [40 to 60 centimeters]), with summer "monsoons" during the growing season contributing substantial moisture. The composition and structure of the overstory are dependent upon the temperature and moisture relationships of the site and the successional status of the occurrence. *Pseudotsuga menziesii* and *Abies concolor* are most frequent, but *Pinus ponderosa* may be present to codominant. *Pinus flexilis* is common in Nevada. *Pseudotsuga menziesii* forests occupy drier sites, and *Pinus ponderosa* is a common codominant. *Abies concolor*-dominated forests occupy cooler sites, such as upper slopes at higher elevations, canyon sideslopes, ridgetops, and north- and east-facing slopes that burn somewhat infrequently. *Picea pungens* is most often found in cool, moist locations, often occurring as smaller patches in a matrix of other associations. As many as seven conifers can be found growing in the same occurrence, and there are a number of cold-deciduous shrub and graminoid species common, including *Arctostaphylos uva-ursi*, *Mahonia repens*, *Paxistima myrsinites*, *Symphoricarpos oreophilus*, *Jamesia americana*, *Quercus gambelii*, and *Festuca arizonica*. This system was undoubtedly characterized by a mixed-severity fire regime in its "natural condition," characterized by a high degree of variability in lethality and return interval (NatureServe 2012).

Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland

These are mixed conifer forests of the Rocky Mountains west into the ranges of the Great Basin, occurring predominantly in cool ravines and on north-facing slopes. Elevations range from 3,900 to 10,825 feet (1,200 to 3,300 meters). Occurrences of this system are found on cooler and more mesic sites than Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland. Such sites include lower and middle slopes of ravines, along stream terraces, moist, concave topographic positions and north- and east-facing slopes that burn somewhat infrequently. *Pseudotsuga menziesii* and *Abies concolor* are most common canopy dominants, but *Picea engelmannii*, *Picea pungens*, or *Pinus ponderosa* may be present. This system includes mixed conifer (*Populus tremuloides*) stands. A number of cold-deciduous shrub species can occur, including *Acer glabrum*, *Acer grandidentatum*, *Alnus incana*, *Betula occidentalis*, *Cornus sericea*, *Jamesia americana*, *Physocarpus malvaceus*, *Robinia neomexicana*, *Vaccinium membranaceum*, and *Vaccinium myrtillus*. Herbaceous species include *Bromus ciliatus*, *Carex geyeri*, *Carex rossii*, *Carex siccata*, *Muhlenbergia virescens*, *Pseudoroegneria spicata*, *Erigeron eximius*, *Fragaria virginiana*, *Luzula parviflora*, *Osmorhiza berteroi*, *Packera cardamine*, *Thalictrum occidentale*, and *Thalictrum fendleri*. Naturally occurring fires are of variable return intervals and mostly light, erratic, and infrequent due to the cool, moist conditions.

E.1.10 Mountain Shrub

Harvested Forest-Shrub Regeneration

Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in early successional stage or trees stunted from environmental conditions following a tree harvesting event (University of Idaho 2012).

Inter-Mountain Basins Curl-leaf Mountain-Mahogany Woodland and Shrubland

This ecological system occurs in hills and mountain ranges of the Intermountain West basins from the eastern foothills of the Sierra Nevada northeast to the foothills of the Bighorn Mountains. It typically

occurs from 1,950 feet (600 meters) to over 8,600 feet (2,650 meters) in elevation on rocky outcrops or escarpments and forms small- to large-patch stands in forested areas. Most stands occur as shrublands on ridges and steep rimrock slopes, but they may be composed of small trees in steppe areas. Scattered junipers or pines may also occur. This system includes both woodlands and shrublands dominated by *Cercocarpus ledifolius*, *Artemisia tridentata* ssp. *vaseyana*, *Purshia tridentata*, with species of *Arctostaphylos*, *Ribes*, or *Symphoricarpos* are often present. Undergrowth is often very sparse and dominated by bunch grasses, usually *Pseudoroegneria spicata* and *Festuca idahoensis*. *Cercocarpus ledifolius* is a slow-growing, drought-tolerant species that generally does not resprout after burning and needs the protection from fire that rocky sites provide (NatureServe 2012).

Northern Rocky Mountain Montane-Foothill Deciduous Shrubland

This shrubland ecological system is found in the lower montane and foothill regions around the Columbia Basin, and north and east into the northern Rockies, including Alberta and British Columbia. These shrublands typically occur below treeline, in the matrix of surrounding low-elevation grasslands and sagebrush shrublands. They also occur in the ponderosa pine and Douglas-fir zones, but rarely up into the subalpine zone (on dry sites). The shrublands are usually found on steep slopes of canyons and in areas with some soil development, either loess deposits or volcanic clays; they occur on all aspects. Fire, flooding and erosion all impact these shrublands, but they typically will persist on sites for long periods. These communities develop near talus slopes as garlands, at the heads of dry drainages, and toeslopes in the moist shrub-steppe and steppe zones. *Physocarpus malvaceus*, *Prunus emarginata*, *Prunus virginiana*, *Rosa* spp., *Rhus glabra*, *Acer glabrum*, *Amelanchier alnifolia*, *Symphoricarpos albus*, *Symphoricarpos oreophilus*, and *Holodiscus discolor* are the most common dominant shrubs, occurring alone or any combination. In the Alberta's Upper and Lower Foothills subregions, common shrubs include *Arctostaphylos uva-ursi*, *Juniperus communis*, *Symphoricarpos* spp., *Amelanchier alnifolia*, and *Rosa* spp. *Rubus parviflorus* and *Ceanothus velutinus* are other important shrubs in this system, being more common in montane occurrences than in subalpine situations. Occurrences in central and eastern Wyoming can include *Artemisia tridentata* ssp. *vaseyana* and *Cercocarpus montanus*, but neither of these is dominant, and where they occur, the stands are truly mixes of shrubs, often with *Amelanchier alnifolia*, *Prunus virginiana*, and others being the predominant taxa. In moist areas, *Crataegus douglasii* can be common. *Shepherdia canadensis* and *Spiraea betulifolia* can be abundant in some cases but also occur in Northern Rocky Mountain Subalpine Deciduous Shrubland. *Festuca idahoensis*, *Festuca campestris*, *Calamagrostis rubescens*, *Carex geyeri*, *Koeleria macrantha*, *Pseudoroegneria spicata*, and *Poa secunda* are the most important grasses. *Achnatherum thurberianum* and *Leymus cinereus* can be locally important. *Poa pratensis* and *Phleum pratense* are common introduced grasses. *Geum triflorum*, *Potentilla gracilis*, *Lomatium triternatum*, *Balsamorhiza sagittata*, and species of *Eriogonum*, *Phlox*, and *Erigeron* are important forbs (NatureServe 2012).

Northern Rocky Mountain Subalpine Deciduous Shrubland

This shrubland ecological system is found in the zone of continuous forest in the upper montane and lower subalpine zones of the northern Rocky Mountains. Soils tend to be moist to wet. Stands are typically initiated by fires and will persist on sites for long periods because of repeated burns and changes in the presence of volatile oils in the soil that impedes tree regeneration. *Menziesia ferruginea*, *Rhamnus alnifolia*, *Ribes lacustre*, *Rubus parviflorus*, *Alnus viridis*, *Rhododendron albiflorum*, *Sorbus scopulina*, *Sorbus sitchensis*, *Vaccinium myrtillus*, *Vaccinium scoparium*, and *Vaccinium membranaceum* are the most common dominant shrubs, occurring alone or in any combination. Other shrubs can include *Shepherdia canadensis* and *Ceanothus velutinus*, but these also commonly occur in Northern Rocky Mountain Montane-Foothill Deciduous Shrubland. *Rubus parviflorus* and *Ceanothus velutinus* are occasionally present, being more common in montane shrublands than in this subalpine system. Important

forbs include *Xerophyllum tenax*, *Chamerion angustifolium*, and *Pteridium aquilinum*, reflecting the mesic nature of many of these shrublands (NatureServe 2012).

Rocky Mountain Gambel Oak-Mixed Montane Shrubland

This ecological system occurs in the mountains, plateaus and foothills of the southern Rocky Mountains and Colorado Plateau, including the Uinta and Wasatch ranges and the Mogollon Rim. These shrublands are most commonly found along dry foothills, lower mountain slopes, and at the edge of the western Great Plains from approximately 6,500 to 9500 feet (2,000 to 2,900 meters) in elevation, and are often situated above pinyon-juniper woodlands. Substrates are variable and include soil types ranging from calcareous, heavy, fine-grained loams to sandy loams, gravelly loams, clay loams, deep alluvial sand, or coarse gravel. The vegetation is typically dominated by *Quercus gambelii* alone or codominant with *Amelanchier alnifolia*, *Amelanchier utahensis*, *Artemisia tridentata*, *Cercocarpus montanus*, *Prunus virginiana*, *Purshia stansburiana*, *Purshia tridentata*, *Robinia neomexicana*, *Symphoricarpos oreophilus*, or *Symphoricarpos rotundifolius*. There may be inclusions of other mesic montane shrublands with *Quercus gambelii* absent or as a relatively minor component. This ecological system intergrades with the lower montane-foothills shrubland system and shares many of the same site characteristics. Density and cover of *Quercus gambelii* and *Amelanchier* spp. often increase after fire (NatureServe 2012).

Rocky Mountain Lower Montane-Foothill Shrubland

This ecological system is found in the foothills, canyon slopes and lower mountains of the Rocky Mountains and on outcrops and canyon slopes in the western Great Plains. It ranges from southern New Mexico, extending north into Wyoming, and west into the Intermountain West region. These shrublands occur between 4,900 and 9,500 feet (1,500 and 2,900 meters) elevation and are usually associated with exposed sites, rocky substrates, and dry conditions, which limit tree growth. It is common where *Quercus gambelii* is absent, such as the northern Colorado Front Range and in drier foothills and prairie hills. This system is generally drier than Rocky Mountain Gambel Oak-Mixed Montane Shrubland but may include mesic montane shrublands where *Quercus gambelii* does not occur. *Cercocarpus montanus* dominates pure stands in parts of Wyoming and Colorado. Scattered trees or inclusions of grassland patches or steppe may be present, but the vegetation is typically dominated by a variety of shrubs, including *Amelanchier utahensis*, *Cercocarpus montanus*, *Purshia tridentata*, *Rhus trilobata*, *Ribes cereum*, *Symphoricarpos oreophilus*, or *Yucca glauca*. Grasses are represented as species of *Muhlenbergia*, *Bouteloua*, *Hesperostipa*, and *Pseudoroegneria spicata*. Fires play an important role in this system as the dominant shrubs usually have a severe die-back, although some plants will stump sprout. *Cercocarpus montanus* requires a disturbance such as fire to reproduce, either by seed sprout or root-crown sprouting. Fire suppression may have allowed an invasion of trees into some of these shrublands, but in many cases sites are too xeric for tree growth. In Wyoming, stands where *Cercocarpus montanus* is a component of mixed shrublands are placed in Northern Rocky Mountain Montane-Foothill Deciduous Shrubland (NatureServe 2012).

E.1.11 Pinyon-Juniper

Colorado Plateau Pinyon-Juniper Shrubland

This ecological system is characteristic of the rocky mesatops and slopes on the Colorado Plateau and western slope of Colorado, but these stunted tree shrublands may extend further upslope along the low-elevation margins of taller pinyon-juniper woodlands. Sites are drier than Colorado Plateau Pinyon-Juniper Woodland. Substrates are shallow/rocky and shaly soils at lower elevations 3,900 to 6,500 feet (1,200 to 2,000 meters). Sparse examples of the system grade into Colorado Plateau Mixed Bedrock Canyon and Tableland. The vegetation is dominated by dwarfed (usually less than 9.5 feet [3 meters] tall) *Pinus edulis* and/or *Juniperus osteosperma* trees forming extensive tall shrublands in the region along

low-elevation margins of pinyon-juniper woodlands. Other shrubs, if present, may include *Artemisia nova*, *Artemisia tridentata* ssp. *wyomingensis*, *Chrysothamnus viscidiflorus*, or *Coleogyne ramosissima*. Herbaceous layers are sparse to moderately dense and typically composed of xeric graminoids.

Colorado Plateau Pinyon-Juniper Woodland

This ecological system occurs in dry mountains and foothills of the Colorado Plateau region including the Western Slope of Colorado to the Wasatch Range, south to the Mogollon Rim, and east into the northwestern corner of New Mexico. It is typically found at lower elevations ranging from 4,900 to 8,000 feet (1,500 to 2,440 meters). These woodlands occur on warm, dry sites on mountain slopes, mesas, plateaus, and ridges. Severe climatic events occurring during the growing season, such as frosts and drought, are thought to limit the distribution of pinyon-juniper woodlands to relatively narrow altitudinal belts on mountainsides. Soils supporting this system vary in texture, ranging from stony, cobbly, gravelly sandy loams to clay loam or clay. *Pinus edulis* and/or *Juniperus osteosperma* dominate the tree canopy. In the southern portion of the Colorado Plateau in northern Arizona and northwestern New Mexico, *Juniperus monosperma* and hybrids of *Juniperus* spp. may dominate or codominate the tree canopy. *Juniperus scopulorum* may codominate or replace *Juniperus osteosperma* at higher elevations. Understory layers are variable and may be dominated by shrubs, graminoids, or be absent. Associated species include *Arctostaphylos patula*, *Artemisia tridentata*, *Cercocarpus intricatus*, *Cercocarpus montanus*, *Coleogyne ramosissima*, *Purshia stansburiana*, *Purshia tridentata*, *Quercus gambelii*, *Bouteloua gracilis*, *Pleuraphis jamesii*, *Pseudoroegneria spicata*, *Poa secunda*, or *Poa fendleriana*. This system occurs at higher elevations than Great Basin Pinyon-Juniper Woodland and Colorado Plateau shrubland systems where sympatric (NatureServe 2012).

Great Basin Pinyon-Juniper Woodland

This ecological system occurs on dry mountain ranges of the Great Basin region and eastern foothills of the Sierra Nevada south in scattered locations throughout southern California. It is typically found at lower elevations ranging from 5,200 to 8,500 feet (1,600 to 2,600 meters). These woodlands occur on warm, dry sites on mountain slopes, mesas, plateaus and ridges. Severe climatic events occurring during the growing season, such as frosts and drought, are thought to limit the distribution of pinyon-juniper woodlands to relatively narrow altitudinal belts on mountainsides. Woodlands dominated by a mix of *Pinus monophylla* and *Juniperus osteosperma*, pure or nearly pure occurrences of *Pinus monophylla*, or woodlands dominated solely by *Juniperus osteosperma* comprise this system, but in some regions of southern California, *Juniperus osteosperma* is replaced by *Juniperus californica*. *Cercocarpus ledifolius* is a common associate. On the east slope of the Sierras in California, *Pinus jeffreyi* and *Juniperus occidentalis* var. *australis* may be components of these woodlands. Understory layers are variable. Associated species include shrubs such as *Arctostaphylos patula*, *Artemisia arbuscula*, *Artemisia nova*, *Artemisia tridentata*, *Cercocarpus ledifolius*, *Cercocarpus intricatus*, *Coleogyne ramosissima*, *Yucca brevifolia*, *Quercus gambelii*, *Quercus turbinella*, *Quercus john-tuckeri*, *Juniperus californica*, *Quercus chrysolepis*, and bunch grasses *Hesperostipa comata*, *Festuca idahoensis*, *Pseudoroegneria spicata*, *Leymus cinereus* (= *Elymus cinereus*), and *Poa fendleriana*. This system occurs at lower elevations than Colorado Plateau Pinyon-Juniper Woodland where sympatric (NatureServe 2012).

Inter-Mountain Basins Juniper Savanna

This widespread ecological system occupies dry foothills and sandsheets of western Colorado, northwestern New Mexico, northern Arizona, Utah, and west into the Great Basin of Nevada and southern Idaho. It is typically found at lower elevations ranging from 4,920 to 7,500 feet (1,500 to 2,300 meters). This system is generally found at lower elevations and more xeric sites than Great Basin Pinyon-Juniper Woodland or Colorado Plateau Pinyon-Juniper Woodland. These occurrences are found on lower

mountain slopes, hills, plateaus, basins and flats often where juniper is expanding into semi-desert grasslands and steppe. The vegetation is typically open savanna, although there may be inclusions of denser juniper woodlands. This savanna is typically dominated by *Juniperus osteosperma* trees with high cover of perennial bunch grasses and forbs, with *Bouteloua gracilis*, *Hesperostipa comata*, and *Pleuraphis jamesii* being most common. In the southern Colorado Plateau, *Juniperus monosperma* or juniper hybrids may dominate the tree layer. Pinyon trees are typically not present because sites are outside the ecological or geographic range of *Pinus edulis* and *Pinus monophylla*. It has been suggested that all *Juniperus osteosperma* stands in Wyoming be placed in Colorado Plateau Pinyon-Juniper Woodland. This savanna system does not occur in Wyoming (NatureServe 2012).

Rocky Mountain Foothill Limber Pine-Juniper Woodland

This ecological system occurs in foothill and lower montane zones in the Rocky Mountains from northern Montana south to central Colorado and on escarpments across Wyoming extending out into the western Great Plains. Elevation ranges from 3,280 to 7,870 feet (1,000 to 2,400 meters). It occurs generally below continuous forests of *Pseudotsuga menziesii* or *Pinus ponderosa* and can occur in large stands well in the zone of continuous forests in the northeastern Rocky Mountains. It is restricted to shallow soils and fractured bedrock derived from a variety of parent material, including limestone, sandstone, dolomite, granite and colluvium. Soils have a high rock component (typically over 50 percent cover) and are coarse-to fine-textured, often gravelly and calcareous. Slopes are typically moderately steep to steep. At higher elevations, it is limited to the most xeric aspects on rock outcrops, and at lower elevations to the relatively mesic north aspects. Fire is infrequent and spotty because rocky substrates prevent a continuous vegetation canopy needed to spread. Vegetation is characterized by an open-tree canopy or patchy woodland that is dominated by either *Pinus flexilis*, *Juniperus osteosperma*, or *Juniperus scopulorum*. *Pinus edulis* is not present. A sparse to moderately dense short-shrub layer, if present, may include a variety of shrubs, such as *Arctostaphylos uva-ursi*, *Artemisia nova*, *Artemisia tridentata*, *Cercocarpus ledifolius*, *Cercocarpus montanus*, *Dasiphora fruticosa* ssp. *floribunda*, *Ericameria nauseosa*, *Juniperus horizontalis*, *Purshia tridentata*, *Rhus trilobata*, *Rosa woodsii*, *Shepherdia canadensis* (important in Montana stands), *Symphoricarpos albus*, or *Symphoricarpos oreophilus*. Herbaceous layers are generally sparse, but range to moderately dense, and are typically dominated by perennial graminoids such as *Bouteloua gracilis*, *Festuca idahoensis*, *Festuca campestris*, *Danthonia intermedia*, *Leucopoa kingii*, *Hesperostipa comata*, *Koeleria macrantha*, *Piptatherum micranthum*, *Poa secunda*, or *Pseudoroegneria spicata*. In this ecological system, there may be small patches of grassland or shrubland composed of some of the above species. In Wyoming, some limber pine stands are found up to 8,000 feet (2,440 meters) elevation and are still included in this system (NatureServe 2012).

Southern Rocky Mountain Pinyon-Juniper Woodland

This southern Rocky Mountain ecological system occurs on dry mountains and foothills in southern Colorado east of the Continental Divide, in mountains and plateaus of north-central New Mexico, and extends out onto limestone breaks in the southeastern Great Plains. These woodlands occur on warm, dry sites on mountain slopes, mesas, plateaus, and ridges. Severe climatic events occurring during the growing season, such as frosts and drought, are thought to limit the distribution of pinyon-juniper woodlands to relatively narrow altitudinal belts on mountainsides. Soils supporting this system vary in texture ranging from stony, cobbly, gravelly sandy loams to clay loam or clay. *Pinus edulis* and/or *Juniperus monosperma* dominate the tree canopy. *Juniperus scopulorum* may codominate or replace *Juniperus monosperma* at higher elevations. Stands with *Juniperus osteosperma* are representative the Colorado Plateau and are not included in this system. In southern transitional areas between Madrean Pinyon-Juniper Woodland and Southern Rocky Mountain Pinyon-Juniper Woodland in central New Mexico, *Juniperus deppeana* becomes common. Understory layers are variable and may be dominated by shrubs, graminoids, or be absent. Associated species are more typical of southern Rocky Mountains than

the Colorado Plateau and include *Artemisia bigelovii*, *Cercocarpus montanus*, *Quercus gambelii*, *Achnatherum scribneri*, *Bouteloua gracilis*, *Festuca arizonica*, or *Pleuraphis jamesii* (NatureServe 2012).

E.1.12 Ponderosa Pine

Northern Rocky Mountain Foothill Conifer Wooded Steppe

This inland Pacific Northwest ecological system occurs in the foothills of the northern Rocky Mountains in the Columbia Plateau region and west along the foothills of the Modoc Plateau and eastern Cascades into southern interior British Columbia. It also occurs east across Idaho into the eastern foothills of the Montana Rockies. The system may also occur on the lower treeline slopes of the Wyoming Rockies. These wooded steppes occur at the lower treeline/ecotone between grasslands or shrublands and forests and woodlands, typically on warm, dry, exposed sites too droughty to support a closed tree canopy. This is not a fire-maintained system. The "savanna" character results from a climate-edaphic interaction that results in widely scattered trees over shrubs or grasses, and even in the absence of fire, a "woodland" or "forest" structure will not be obtained. Elevations range from less than 1,640 feet (500 meters) in British Columbia to 5,200 feet (1,600 meters) in the central Idaho Mountains. Occurrences are found on all slopes and aspects; however, moderately steep to very steep slopes or ridgetops are most common. This system can occur in association with cliff and canyon systems. It generally occurs on glacial till, glacio-fluvial sand and gravel, dune, basaltic rubble, colluvium, to deep loess or volcanic ash-derived soils, with characteristic features of good aeration and drainage, coarse textures, circumneutral to slightly acidic pH, an abundance of mineral material, rockiness, and periods of drought during the growing season. These can also occur on areas of sand dunes, scablands, and pumice where the edaphic conditions limit tree abundance. *Pinus ponderosa* (vars. *ponderosa* and *scopulorum*) and *Pseudotsuga menziesii* are the predominant conifers (not always together); *Pinus flexilis* may be present or common in the tree canopy. In interior British Columbia, *Pseudotsuga menziesii* is the characteristic canopy dominant. In transition areas with big sagebrush steppe systems, *Purshia tridentata*, *Artemisia tridentata* ssp. *wyomingensis*, *Artemisia tridentata* ssp. *tridentata*, and *Artemisia tripartita* may be common in fire-protected sites such as rocky areas. Deciduous shrubs, such as *Physocarpus malvaceus*, *Symphoricarpos albus*, or *Spiraea betulifolia*, can be abundant in more northerly sites or more moist climates. Important grass species include *Pseudoroegneria spicata*, *Poa secunda*, *Hesperostipa* spp., *Achnatherum* spp., and *Elymus elymoides* (NatureServe 2012).

Southern Rocky Mountain Ponderosa Pine Woodland

This very widespread ecological system is most common throughout the cordillera of the Rocky Mountains, from the Greater Yellowstone region south. It is also found in the Colorado Plateau region, west into scattered locations of the Great Basin. Its easternmost extent in Wyoming is in the Bighorn Mountains. These woodlands occur at the lower treeline/ecotone between grassland or shrubland and more mesic coniferous forests typically in warm, dry, exposed sites. Elevations range from less than 6,230 feet (1,900 meters) in northern Wyoming to 9,180 feet (2,800 meters) in the New Mexico Mountains. Occurrences are found on all slopes and aspects; however, moderately steep to very steep slopes or ridgetops are most common. This ecological system generally occurs on soils derived from igneous, metamorphic, and sedimentary material, with characteristic features of good aeration and drainage, coarse textures, circumneutral to slightly acidic pH, an abundance of mineral material, rockiness, and periods of drought during the growing season. Northern Rocky Mountain Ponderosa Pine Woodland and Savanna in the eastern Cascades, Okanogan, and northern Rockies regions receives winter and spring rains, and thus has a greater spring "green-up" than the drier woodlands in the central Rockies. *Pinus ponderosa* (primarily var. *scopulorum* and var. *ponderosa* (= var. *brachyptera*)) is the predominant conifer; *Pseudotsuga menziesii*, *Pinus edulis*, *Pinus contorta*, *Populus tremuloides*, and *Juniperus* spp. may be present in the tree canopy. The understory is usually shrubby, with *Artemisia nova*, *Artemisia*

tridentata, *Arctostaphylos patula*, *Arctostaphylos uva-ursi*, *Cercocarpus montanus*, *Purshia stansburiana*, *Purshia tridentata*, *Quercus gambelii*, *Symphoricarpos* spp., *Prunus virginiana*, *Amelanchier alnifolia* (less so in Montana), and *Rosa* spp. common species. *Pseudoroegneria spicata*, *Pascopyrum smithii*, and species of *Hesperostipa*, *Achnatherum*, *Festuca*, *Muhlenbergia*, and *Bouteloua* are some of the common grasses. Mixed fire regimes and ground fires of variable return intervals maintain these woodlands, depending on climate, degree of soil development, and understory density (NatureServe 2012).

E.1.13 Riparian

Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland

This system occurs in mountain ranges of the Great Basin and along the eastern slope of the Sierra Nevada in a broad elevation range from about 4,000 feet (1,220 meters) to over 7,000 feet (2,135 meters). This system often occurs as a mosaic of multiple communities that are tree-dominated with a diverse shrub component. The variety of plant associations connected to this system reflects elevation, stream gradient, floodplain width, and flooding events. Dominant trees may include *Abies concolor*, *Alnus incana*, *Betula occidentalis*, *Populus angustifolia*, *Populus balsamifera* ssp. *trichocarpa*, *Populus fremontii*, *Salix laevigata*, *Salix gooddingii*, and *Pseudotsuga menziesii*. Dominant shrubs include *Artemisia cana*, *Cornus sericea*, *Salix exigua*, *Salix lasiolepis*, *Salix lemmonii*, or *Salix lutea*. Herbaceous layers are often dominated by species of *Carex* and *Juncus*, and perennial grasses and mesic forbs such as *Deschampsia caespitosa*, *Elymus trachycaulus*, *Glyceria striata*, *Iris missouriensis*, *Maianthemum stellatum*, or *Thalictrum fendleri*. Introduced forage species such as *Agrostis stolonifera*, *Poa pratensis*, *Phleum pratense*, and the weedy annual *Bromus tectorum* are often present in disturbed stands. These are disturbance-driven systems that require flooding, scour and deposition for germination and maintenance. Livestock grazing is a major influence in altering structure, composition, and function of the community (NatureServe 2012).

Introduced Riparian and Wetland Vegetation

Vegetation dominated (typically greater than 60 percent canopy cover) by introduced species. These are spontaneous, self-perpetuating, and not (immediately) the result of planting, cultivation, or human maintenance. Land occupied by introduced vegetation is generally permanently altered (converted) unless restoration efforts are undertaken. Specifically, land cover is significantly altered/disturbed by introduced riparian and wetland vegetation (University of Idaho 2012).

Northwestern Great Plains Riparian

This system is found in the riparian areas of medium and small rivers and streams throughout the northwestern Great Plains. It is likely most common in the Northern Great Plains Steppe. This system occurs in the Upper Missouri and tributaries starting at the Niobrara, White, Cheyenne, Belle Fourche, Moreau, Grand, Heart, Little Missouri, Yellowstone, Powder, Tongue, Bighorn, Wind, Milk, Musselshell, Marias, and Teton rivers; and in Canada, the Southern Saskatchewan, Red Deer and Old Man rivers to where they extend into Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland or Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland. These are found on alluvial soils in highly variable landscape settings, from deep cut ravines to wide, braided streambeds. Hydrologically, these tend to be more flashy with less developed floodplain than on larger rivers, and typically dry down completely for some portion of the year. Dominant vegetation shares much with generally drier portions of larger floodplain systems downstream, but overall abundance of vegetation is generally lower. Communities in this system range from riparian forests and shrublands to gravel/sand flats. Dominant species include *Populus deltoides*, *Populus balsamifera* ssp. *trichocarpa*, *Salix* spp., *Artemisia cana* ssp. *cana*, and *Pascopyrum smithii*. These areas are often subjected to heavy grazing

and/or agriculture and can be heavily degraded. Another factor is that groundwater depletion and lack of fire have created additional species changes (NatureServe 2012).

Rocky Mountain Bigtooth Maple Ravine Woodland

This ecological system occurs in cool ravines, on toeslopes and slump benches associated with riparian areas in the northern and central Wasatch Range and Tavaputs Plateau extending into southern Idaho, as well as in scattered localities in southwestern Utah, central Arizona and New Mexico and the Trans-Pecos of Texas. Substrates are typically rocky colluvial or alluvial soils with favorable soil moisture. These woodlands are dominated by *Acer grandidentatum* but may include mixed stands codominated by *Quercus gambelii* or with scattered conifers. Some stands may include *Acer negundo* or *Populus tremuloides* as minor components. It also occurs on steeper, north-facing slopes at higher elevations, often adjacent to Rocky Mountain Gambel Oak-Mixed Montane Shrubland or Rocky Mountain Aspen Forest and Woodland (NatureServe 2012).

Rocky Mountain Lower Montane Riparian Woodland and Shrubland

This ecological system of the northern Rocky Mountains and the east slopes of the Cascades consists of deciduous, coniferous, and mixed conifer-deciduous forests that occur on streambanks and river floodplains of the lower montane and foothill zones. Riparian forest stands are maintained by annual flooding and hydric soils throughout the growing season. Riparian forests are often accompanied by riparian shrublands or open areas dominated by wet meadows. *Populus balsamifera* is the key indicator species. Several other tree species can be mixed in the canopy, including *Populus tremuloides*, *Betula papyrifera*, *Betula occidentalis*, *Picea mariana*, and *Picea glauca*. *Abies grandis*, *Thuja plicata*, and *Tsuga heterophylla* are commonly dominant canopy species in western Montana and northern Idaho occurrences, in lower montane riparian zones. Shrub understory components include *Cornus sericea*, *Acer glabrum*, *Alnus incana*, *Betula papyrifera*, *Oplopanax horridus*, and *Symphoricarpos albus*. Ferns and forbs of mesic sites are commonly present in many occurrences, including such species as *Athyrium filix-femina*, *Gymnocarpium dryopteris*, and *Senecio triangularis* (NatureServe 2012).

Rocky Mountain Subalpine-Montane Riparian Shrubland

This system is found throughout the Rocky Mountain cordillera from New Mexico north into Montana and northwestern Alberta, and also occurs in mountainous areas of the Intermountain West region and Colorado Plateau. These are montane to subalpine riparian shrublands occurring as narrow bands of shrubs lining streambanks and alluvial terraces in narrow to wide, low-gradient valley bottoms and floodplains with sinuous stream channels. Generally, the system is found at higher elevations, but can be found anywhere from 4,920 to 11,400 feet (1,500 to 3,475 meters), and may occur at even lower elevations in the Canadian Rockies. Occurrences can also be found around seeps, fens, and isolated springs on hillslopes away from valley bottoms. Many of the plant associations found in this system are associated with beaver activity. This system often occurs as a mosaic of multiple communities that are shrub- and herb-dominated and includes above-treeline, willow-dominated, snowmelt-fed basins that feed into streams. The dominant shrubs reflect the large elevational gradient and include *Alnus incana*, *Betula glandulosa*, *Betula occidentalis*, *Cornus sericea*, *Salix bebbiana*, *Salix boothii*, *Salix brachycarpa*, *Salix drummondiana*, *Salix eriocephala*, *Salix geyeriana*, *Salix monticola*, *Salix planifolia*, and *Salix wolfii*. Generally the upland vegetation surrounding these riparian systems are of either conifer or aspen forests (NatureServe 2012).

Rocky Mountain Subalpine-Montane Riparian Woodland

This riparian woodland system is comprised of seasonally flooded forests and woodlands found at montane to subalpine elevations of the Rocky Mountain cordillera, from southern New Mexico north into

Montana, and west into the Intermountain region and the Colorado Plateau. It occurs throughout the interior of British Columbia and the eastern slopes of the Cascade Mountains. This system contains the conifer and aspen woodlands that line montane streams. These are communities tolerant of periodic flooding and high water tables. Snowmelt moisture in this system may create shallow water tables or seeps for a portion of the growing season. Stands typically occur at elevations between 4,920 and 10,830 feet (1,500 and 3,300 meters), farther north elevation ranges between 2,950 and 6,560 feet (900 and 2,000 meters). This is confined to specific riparian environments occurring on floodplains or terraces of rivers and streams, in V-shaped, narrow valleys and canyons (where there is cold-air drainage). Less frequently, occurrences are found in moderate-wide valley bottoms on large floodplains along broad, meandering rivers, and on pond or lake margins. Dominant tree species vary across the latitudinal range, although it usually includes *Abies lasiocarpa* and/or *Picea engelmannii*; other important species include *Pseudotsuga menziesii*, *Picea pungens*, *Picea engelmannii* X *glauca*, *Populus tremuloides*, and *Juniperus scopulorum*. Other trees possibly present but not usually dominant include *Alnus incana*, *Abies concolor*, *Abies grandis*, *Pinus contorta*, *Populus angustifolia*, *Populus balsamifera* ssp. *trichocarpa*, and *Juniperus osteosperma* (NatureServe 2012).

Western Great Plains Floodplain

This ecological system is found in the floodplains of medium and large rivers of the western Great Plains. It occurs on the lower reaches of the North and South Platte, Platte, Arkansas, and Canadian rivers. Alluvial soils and periodic, intermediate flooding (every 5 to 25 years) typify this system. These are the perennial big rivers of the region with hydrologic dynamics largely driven by snowmelt in the mountains, instead of local precipitation events. Dominant communities in this system range from floodplain forests to wet meadows to gravel/sand flats; however, they are linked by underlying soils and the flooding regime. Dominant species include *Populus deltoides* and *Salix* spp. Grass cover underneath the trees is an important part of this system and is a mix of tallgrass species, including *Panicum virgatum* and *Andropogon gerardii*. Sometimes, *Tamarix* spp. and less desirable or exotic grasses and forbs can invade degraded areas in the floodplains, especially in the western portion of the province. These areas are often subjected to heavy grazing and/or agriculture and can be heavily degraded. Groundwater depletion and lack of fire have created additional alterations in species composition. In most cases, the majority of the wet meadow and prairie communities may be extremely degraded or extirpated from examples of this system (NatureServe 2012).

Western Great Plains Riparian Woodland and Shrubland

These are the stream and creek-side woodlands and shrublands found in the western Great Plains. They usually occur in shortgrass prairie or other types of grasslands. They occur in draws and along small rivers in deep cut ravines to wider meandering streambeds. Flows in these streams can be flashy, and may dry down completely for some portion of the year. Dominant species vary with the size of the stream and valley type. Plains cottonwood, willows and silver sagebrush are the most common with an herbaceous understory composed of grasses including little bluestem, western wheatgrass, and sand dropseed. Heavy use such as frequent livestock grazing or heavy agricultural runoff can increase stream salinity resulting in non-native trees such as tamarisk and Russian olive replacing native species. See also a similar system that occurs along larger rivers, for example the South Platte, called the Western Great Plains Floodplain System (University of Idaho 2012).

E.1.14 Shrub/Shrub Steppe

Colorado Plateau Blackbrush-Mormon-tea Shrubland

This ecological system occurs in the Colorado Plateau on benchlands, colluvial slopes, pediments or bajadas. Elevation ranges from 1,835 to 5,410 feet (560 to 1,650 meters). Substrates are shallow, typically

calcareous, non-saline and gravelly or sandy soils over sandstone or limestone bedrock, caliche or limestone alluvium. It also occurs in deeper soils on sandy plains where it may have invaded desert grasslands. The vegetation is characterized by extensive open shrublands dominated by *Coleogyne ramosissima* often with *Ephedra viridis*, *Ephedra torreyana*, or *Grayia spinosa*. Sandy portions may include *Artemisia filifolia* as codominant. The herbaceous layer is sparse and composed of graminoids such as *Achnatherum hymenoides*, *Pleuraphis jamesii*, or *Sporobolus cryptandrus* (NatureServe 2012).

Colorado Plateau Mixed Low Sagebrush Shrubland

This ecological system occurs in the Colorado Plateau, Tavaputs Plateau and Uinta Basin in canyons, gravelly draws, hilltops, and dry flats at elevations generally below 5,900 feet (1,800 meters). Soils are often rocky, shallow, and alkaline. This type extends across northern New Mexico into the southern Great Plains on limestone hills. It includes open shrublands and steppe dominated by *Artemisia nova* or *Artemisia bigelovii* sometimes with *Artemisia tridentata* ssp. *wyomingensis* codominant. Semi-arid grasses such as *Achnatherum hymenoides*, *Aristida purpurea*, *Bouteloua gracilis*, *Hesperostipa comata*, *Pleuraphis jamesii*, or *Poa fendleriana* are often present and may form a graminoid layer with over 25 percent cover (NatureServe 2012).

Great Basin Xeric Mixed Sagebrush Shrubland

This ecological system occurs in the Great Basin on dry flats and plains, alluvial fans, rolling hills, rocky hillslopes, saddles and ridges at elevations between 3,280 and 8,525 feet (1,000 and 2,600 meters). Sites are dry, often exposed to desiccating winds, with typically shallow, rocky, non-saline soils. Shrublands are dominated by *Artemisia nova* (mid and low elevations), *Artemisia arbuscula* ssp. *longicaulis*, or *Artemisia arbuscula* ssp. *longiloba* (higher elevation) and may be codominated by *Artemisia tridentata* ssp. *wyomingensis* or *Chrysothamnus viscidiflorus*. Other shrubs that may be present include *Atriplex confertifolia*, *Ephedra* spp., *Ericameria* spp., *Grayia spinosa*, *Lycium shockleyi*, *Picrothamnus desertorum*, *Sarcobatus vermiculatus*, and *Tetradymia* spp. The herbaceous layer is likely sparse and composed of perennial bunch grasses, such as *Achnatherum hymenoides*, *Achnatherum speciosum*, *Achnatherum thurberianum*, *Elymus elymoides*, or *Poa secunda* (NatureServe 2012).

Inter-Mountain Basins Greasewood Flat

This ecological system occurs throughout much of the western United States in Intermountain basins and extends onto the western Great Plains and into central Montana. It typically occurs near drainages on stream terraces and flats or may form rings around more sparsely vegetated playas. Sites typically have saline soils, a shallow water table and flood intermittently, but remain dry for most growing seasons. The water table remains high enough to maintain vegetation, despite salt accumulations. This system usually occurs as a mosaic of multiple communities, with open to moderately dense shrublands dominated or codominated by *Sarcobatus vermiculatus*. Other shrubs that may be present to codominant in some occurrences include *Atriplex canescens*, *Atriplex confertifolia*, *Atriplex gardneri*, *Artemisia tridentata* ssp. *wyomingensis*, *Artemisia tridentata* ssp. *tridentata*, *Artemisia cana* ssp. *cana*, or *Krascheninnikovia lanata*. Occurrences are often surrounded by mixed salt desert scrub or big sagebrush shrublands. The herbaceous layer, if present, is usually dominated by graminoids. There may be inclusions of *Sporobolus airoides*, *Pascopyrum smithii*, *Distichlis spicata* (where water remains ponded the longest), *Calamovilfa longifolia*, *Poa pratensis*, *Puccinellia nuttalliana*, or *Eleocharis palustris* herbaceous types (NatureServe 2012).

Inter-Mountain Basins Mat Saltbush Shrubland

This ecological system occurs on gentle slopes and rolling plains in the northern Colorado Plateau and Uinta Basin on Mancos shale and arid, windswept basins and plains across parts of Wyoming. It is also

found in eastern Wyoming in Great Plains areas, and may extend north into Montana and Canada. Substrates are shallow, typically saline, alkaline, fine-textured soils developed from shale or alluvium and may be associated with shale badlands. Infiltration rate is typically low. These landscapes typically support dwarf-shrublands composed of relatively pure stands of *Atriplex* spp., such as *Atriplex corrugata* (in Colorado and Utah) or *Atriplex gardneri* (Wyoming and Montana into Canada). Other dominant or codominant dwarf-shrubs may include *Artemisia longifolia*, *Artemisia pedatifida* (very important in Wyoming, rare in Colorado stands), or *Picrothamnus desertorum*, sometimes with a mix of other low shrubs, such as *Krascheninnikovia lanata* or *Tetradymia spinosa*. *Atriplex confertifolia* or *Atriplex canescens* may be present but do not codominate. *Artemisia tridentata* ssp. *wyomingensis* can occur in patches in this system. The herbaceous layer is typically sparse. Scattered perennial forbs occur, such as *Xylorhiza glabriuscula* and *Sphaeralcea grossulariifolia*; perennial grasses *Achnatherum hymenoides*, *Bouteloua gracilis* (not in Wyoming), *Elymus elymoides*, *Elymus lanceolatus* ssp. *lanceolatus*, *Pascopyrum smithii*, *Poa secunda*, or *Sporobolus airoides* may dominate the herbaceous layer. In less saline areas, there may be inclusions of grasslands dominated by *Hesperostipa comata*, *Leymus salinus*, *Pascopyrum smithii*, or *Pseudoroegneria spicata*. In Wyoming and possibly elsewhere, inclusions of non-saline, gravelly barrens or rock outcrops dominated by cushion plants such as *Arenaria hookeri* and *Phlox hoodii* without dwarf-shrubs may be present (these are not restricted to this system). Annuals are seasonally present and may include *Eriogonum inflatum*, *Plantago tweedyi*, *Monolepis nuttalliana*, and the introduced annual grass *Bromus tectorum*. In Montana, *Atriplex gardneri* also occurs associated with badlands, and determining which system it falls into may be difficult (NatureServe 2012).

Inter-Mountain Basins Mixed Salt Desert Scrub

This extensive ecological system includes open-canopied shrublands of typically saline basins, alluvial slopes and plains across the Intermountain western United States. This type also extends in limited distribution into the southern Great Plains. Substrates are often saline and calcareous, medium- to fine-textured, alkaline soils, but include some coarser-textured soils. The vegetation is characterized by a typically open to moderately dense shrubland composed of one or more *Atriplex* species, such as *Atriplex confertifolia*, *Atriplex canescens*, *Atriplex polycarpa*, or *Atriplex spinifera*. *Grayia spinosa* tends to occur on coppice dunes that may have a silty component to them. Northern occurrences lack *Atriplex* species and are typically dominated by *Grayia spinosa*, *Krascheninnikovia lanata*, and/or *Artemisia tridentata*. Other shrubs present to codominant may include *Artemisia tridentata* ssp. *wyomingensis*, *Chrysothamnus viscidiflorus*, *Ericameria nauseosa*, *Ephedra nevadensis*, *Grayia spinosa*, *Krascheninnikovia lanata*, *Lycium* spp., *Picrothamnus desertorum*, or *Tetradymia* spp. In Wyoming, occurrences are typically a mix of *Atriplex confertifolia*, *Grayia spinosa*, *Artemisia tridentata* ssp. *wyomingensis*, *Sarcobatus vermiculatus*, *Krascheninnikovia lanata*, and various *Ericameria* or *Chrysothamnus* species. Some places are a mix of *Atriplex confertifolia* and *Artemisia tridentata* ssp. *wyomingensis*. In the Great Basin, *Sarcobatus vermiculatus* is generally absent but, if present, does not codominate. The herbaceous layer varies from sparse to moderately dense and is dominated by perennial graminoids such as *Achnatherum hymenoides*, *Bouteloua gracilis*, *Elymus lanceolatus* ssp. *lanceolatus*, *Pascopyrum smithii*, *Pleuraphis jamesii*, *Pleuraphis rigida*, *Poa secunda*, or *Sporobolus airoides*. Various forbs are also present (NatureServe 2012).

Inter-Mountain Basins Semi-Desert Shrub-Steppe

This ecological system occurs throughout the Intermountain western United States, typically at lower elevations on alluvial fans and flats with moderate to deep soils, and extends into south-central Montana between the Pryor and Beartooth ranges where a distinct rainshadow effect occurs. This semi-arid shrub-steppe is typically dominated by graminoids (greater than 25 percent cover) with an open shrub to moderately dense woody layer with a typically strong graminoid layer. The most widespread (but not dominant) species is *Pseudoroegneria spicata*, which occurs from the Columbia Basin to the northern

Rockies. Characteristic grasses include *Achnatherum hymenoides*, *Bouteloua gracilis*, *Distichlis spicata*, *Poa secunda*, *Poa fendleriana*, *Sporobolus airoides*, *Hesperostipa comata*, *Pleuraphis jamesii*, and *Leymus salinus*. The woody layer is often a mixture of shrubs and dwarf-shrubs, although it may be dominated by a single species. Characteristic species include *Atriplex canescens*, *Artemisia tridentata*, *Chrysothamnus Greenei*, *Chrysothamnus viscidiflorus*, *Ephedra* spp., *Ericameria nauseosa*, *Gutierrezia sarothrae*, and *Krascheninnikovia lanata*. *Artemisia tridentata* or *Atriplex canescens* may be present but does not dominate. Annual grasses, especially the exotics *Bromus japonicus* and *Bromus tectorum*, may be present to abundant. Forbs are generally of low importance and are highly variable across the range but may be diverse in some occurrences. The general aspect of occurrences may be either open shrubland with patchy grasses or patchy open herbaceous layers. Disturbance may be important in maintaining the woody component. Microphytic crust is very important in some stands (NatureServe 2012).

Southern Colorado Plateau Sand Shrubland

This large-patch ecological system is found on the south-central Colorado Plateau in northeastern Arizona extending into southern and central Utah. It occurs on windswept mesas, broad basins and plains at low to moderate elevations (4,260 to 5,900 feet [1,300 to 1,800 meters]). Substrates are stabilized sandsheets or shallow to moderately deep sandy soils that may form small hummocks or small coppice dunes. This semi-arid, open shrubland is typically dominated by short shrubs (10 to 30 percent cover) with a sparse graminoid layer. The woody layer is often a mixture of shrubs and dwarf-shrubs. Characteristic species include *Ephedra cutleri*, *Ephedra torreyana*, *Ephedra viridis*, and *Artemisia filifolia*. *Coleogyne ramosissima* is typically not present. *Poliomintha incana*, *Parryella filifolia*, *Quercus havardii* var. *tuckeri*, or *Ericameria nauseosa* may be present to dominant locally. *Ephedra cutleri* and *Ephedra viridis* often assume a distinctive matty growth form. Characteristic grasses include *Achnatherum hymenoides*, *Bouteloua gracilis*, *Hesperostipa comata*, and *Pleuraphis jamesii*. The general aspect of occurrences is an open low shrubland but may include small blowouts and dunes. Occasionally grasses may be moderately abundant locally and form a distinct layer. Disturbance may be important in maintaining the woody component. Eolian processes are evident, such as pediceled plants, occasional blowouts or small dunes, but the generally higher vegetative cover and less prominent geomorphic features distinguish this system from Inter-Mountain Basins Active and Stabilized Dune (NatureServe 2012).

Wyoming Basins Dwarf Sagebrush Shrubland and Steppe

This windswept ecological system is composed of dwarf sagebrush shrubland and shrub-steppe that forms matrix vegetation and large patches on the margins of high-elevation basins in central and southern Wyoming. Typical sites are gently rolling hills and long, gently sloping pediments and fans. These sites are very windy and have shallow, often rocky soils. The distinguishing feature of this system is a short-shrub stratum in which dwarf-shrubs (less than 12 inches [30 centimeters] tall) contribute at least two-thirds of the woody canopy. Four sagebrush taxa may dominate the shrub stratum: *Artemisia tripartita* ssp. *rupicola*, *Artemisia nova*, *Artemisia arbuscula* ssp. *longiloba*, and wind-dwarfed *Artemisia tridentata* ssp. *wyomingensis*. Two or more of these sagebrushes often codominate, but any of them may occur alone. Where graminoids are common and tall, the vegetation often has the appearance of grassland without shrubs; the shrubs are obvious only when the vegetation is viewed from up close. Where graminoids contribute less cover, the vegetation is a compact shrubland. The herbaceous component of the vegetation includes both rhizomatous and bunch-form graminoids, cushion plants, and other low-growing forbs. *Bouteloua gracilis*, a common species of Inter-Mountain Basins Big Sagebrush Steppe in Wyoming, is absent (NatureServe 2012).

E.1.15 Water

Open Water (Fresh)

All areas of open water, generally less than 25 percent cover of vegetation or soil. Specifically, inland waters of streams, rivers, ponds and lakes (University of Idaho 2012).

E.1.16 Wetlands

Great Plains Prairie Pothole

The prairie pothole system is found primarily in the glaciated northern Great Plains of the United States and Canada, and is dominated by depressional wetlands formed by glaciers scraping the landscape during the Pleistocene era. This system is typified by several classes of wetlands distinguished by changes in topography, soils and hydrology. Many of the basins in this system are closed basins and receive irregular inputs of water from their surroundings (groundwater and precipitation), and export water as groundwater. Hydrology of the potholes is complex. Precipitation and runoff from snowmelt are often the principal water sources, with groundwater inflow secondary. Evapotranspiration is the major water loss, with seepage loss secondary. Most of the wetlands and lakes contain water that is alkaline (pH greater than 7.4). The concentration of dissolved solids results in water that ranges from fresh to extremely saline. The flora and vegetation of this system are a function of the topography, water regime, and salinity. In addition, because of periodic droughts and wet periods, many wetlands in this system may undergo vegetation cycles. This system includes elements of emergent marshes and wet, sedge meadows that develop into a pattern of concentric rings. This system is responsible for a significant percentage of the annual production of many economically important waterfowl in North America and houses more than 50 percent of North American's migratory waterfowl, with several species reliant on this system for breeding and feeding. Much of the original extent of this system has been converted to agriculture, and only approximately 40 to 50 percent of the system remains undrained (NatureServe 2012).

Inter-Mountain Basins Interdunal Swale Wetland

This ecological system occurs in dune fields in the Intermountain western United States as small (usually less than 0.1 hectare) interdunal wetlands that occur in wind deflation areas, where sands are scoured down to the water table. Small ponds may be associated. The water table may be perched over an impermeable layer of caliche or clay or, in the case of the Great Sand Dunes of Colorado, a geologic dike that creates a closed basin that traps water. These wetland areas are typically dominated by common emergent herbaceous vegetation such as species of *Eleocharis*, *Juncus*, and *Schoenoplectus*. Dune field ecological processes distinguish these emergent wetlands from similar non-dune wetlands (NatureServe 2012).

North American Arid West Emergent Marsh

This widespread ecological system occurs throughout much of the arid and semi-arid regions of western North America, typically surrounded by savanna, shrub-steppe, steppe, or desert vegetation. Natural marshes may occur in depressions in the landscape (ponds, kettle ponds), as fringes around lakes, and along slow-flowing streams and rivers (such riparian marshes are also referred to as sloughs). Marshes are frequently or continually inundated, with water depths up to 6.5 feet (2 meters). Water levels may be stable, or may fluctuate 3.3 feet (1 meter) or more over the course of the growing season. Water chemistry may include some alkaline or semi-alkaline situations, but the alkalinity is highly variable even in the same complex of wetlands. Marshes have distinctive soils that are typically mineral, but can also accumulate organic material. Soils have characteristics that result from long periods of anaerobic conditions in the soils (e.g., gleyed soils, high organic content, redoximorphic features). The vegetation is

characterized by herbaceous plants that are adapted to saturated soil conditions. Common emergent and floating vegetation includes species of *Scirpus* and/or *Schoenoplectus*, *Typha*, *Juncus*, *Potamogeton*, *Polygonum*, *Nuphar*, and *Phalaris*. This system may also include areas of relatively deep water with floating-leaved plants (*Lemna*, *Potamogeton*, and *Brasenia*) and submerged and floating plants (*Myriophyllum*, *Ceratophyllum*, and *Elodea*) (NatureServe 2012).

Rocky Mountain Subalpine-Montane Fen

This system occurs infrequently throughout the Rocky Mountains from Colorado north into Canada. It is confined to specific environments defined by groundwater discharge, soil chemistry, and peat accumulation of at least 15.75 inches (40 centimeters). This system includes extreme rich fens and iron fens, both being quite rare. Fens form at low points in the landscape or near slopes where groundwater intercepts the soil surface. Groundwater inflows maintain a fairly constant water level year-round, with water at or near the surface most of the time. Constant high water levels lead to accumulation of organic material. In addition to peat accumulation and perennially saturated soils, the extreme rich and iron fens have distinct soil and water chemistry, with high levels of one or more minerals such as calcium, magnesium, or iron. These fens usually occur as a mosaic of several plant associations dominated by *Carex aquatilis*, *Carex limosa*, *Carex lasiocarpa*, *Betula glandulosa*, *Kobresia myosuroides*, *Kobresia simpliciuscula*, and *Trichophorum pumilum* (= *Scirpus pumilus*). *Sphagnum* spp. (peatmoss) is indicative of iron fens. The surrounding landscape may be ringed with other wetland systems, e.g., riparian shrublands, or a variety of upland systems from grasslands to forests (NatureServe 2012).

Western Great Plains Closed Depression Wetland

Communities associated with the playa lakes in the southern areas of this province and the rainwater basins in Nebraska characterize this system. They are primarily upland depressional basins. This hydric system is typified by the presence of an impermeable layer such as a dense clay, hydric soil and is usually recharged by rainwater and nearby runoff. They are rarely linked to outside groundwater sources and do not have an extensive watershed. Ponds and lakes associated with this system can experience periodic drawdowns during drier seasons and years, and are often replenished by spring rains. *Eleocharis* spp., *Hordeum jubatum*, along with common forbs such as *Coreopsis tinctoria*, *Symphyotrichum subulatum* (= *Aster subulatus*), and *Polygonum pensylvanicum* (= *Polygonum bicorne*) are common vegetation in the wetter and deeper depression, while *Pascopyrum smithii* and *Buchloe dactyloides* are more common in shallow depressions in rangeland. Species richness can vary considerably among individual examples of this system and is especially influenced by adjacent land use, which is often agriculture, and may provide nutrient and herbicide runoff. Dynamic processes that affect these depressions are hydrological changes, grazing, and conversion to agricultural use (NatureServe 2012).

Western Great Plains Open Freshwater Depression Wetland

This Great Plains emergent marsh ecological system is composed of lowland depressions; it also occurs along lake borders that have more open basins and a permanent water source through most of the year, except during exceptional drought years. These areas are distinct from Western Great Plains Closed Depression Wetland by having a large watershed and/or significant connection to the groundwater table. A variety of species are part of this system, including emergent species of *Typha*, *Carex*, *Eleocharis*, *Juncus*, *Spartina*, and *Schoenoplectus*, as well as floating genera such as *Potamogeton*, *Sagittaria*, *Stuckenia*, or *Ceratophyllum*. The system includes submergent and emergent marshes and associated wet meadows and wet prairies. These types can also drift into stream margins that are more permanently wet and linked directly to the basin via groundwater flow from/into the pond or lake. Some of the specific communities will also be found in the floodplain system and should not be considered a separate system

in that case. These types should also not be considered a separate system if they are occurring in lowland areas of the prairie matrix only because of an exceptional wet year (NatureServe 2012).

Western Great Plains Saline Depression Wetland

This ecological system is very similar to Western Great Plains Open Freshwater Depression Wetland and Western Great Plains Closed Depression Wetland. However, strongly saline soils cause both the shallow lakes and depressions and the surrounding areas to be more brackish. Salt encrustations can occur on the surface in some examples of this system, and the soils are severely affected and have poor structure. Species that typify this system are salt-tolerant and halophytic species such as *Distichlis spicata*, *Sporobolus airoides*, and *Hordeum jubatum*. Other commonly occurring taxa include *Puccinellia nuttalliana*, *Salicornia rubra*, *Schoenoplectus maritimus*, *Schoenoplectus americanus*, *Suaeda calceoliformis*, *Spartina* spp., *Triglochin maritima*, and shrubs such as *Sarcobatus vermiculatus* and *Krascheninnikovia lanata*. During exceptionally wet years, an increase in precipitation can dilute the salt concentration in the soils of some examples of this system that may allow for less salt-tolerant species to occur. Communities found in this system may also occur in floodplains (i.e., more open depressions) but probably should not be considered a separate system unless they transition to areas outside the immediate floodplain (NatureServe 2012).

National Wetlands Inventory

The NWI data for Wyoming, Colorado, and Utah were downloaded from the FWS in January 2012. These data were incorporated into the dataset downloaded from the GAP to provide a more comprehensive inventory of wetland and riparian habitats in the Project area. NWI data coincided with GAP data when the data sets were merged. NWI data are reported in areas where GAP data reported upland land cover categories and NWI reported wetland or riparian cover types. GAP data are reported in areas where both NWI and GAP reported wetland or riparian land cover types, or where GAP reported wetland or riparian cover types and NWI reported upland vegetation.

E.2 Noxious Weeds in the Project Area

Tables E-2 through E-4 present lists of designated noxious weeds in the three states crossed by the Project. Tables E-2, E-4, and E-5 also contain information on noxious weed occurrences in BLM Field Offices and National Forests crossed by the Project, where available.

TABLE E-2 STATE- AND COUNTY-LISTED NOXIOUS WEEDS IN WYOMING FOR LANDS IN THE PROJECT AREA			
Common Name ¹	Scientific Name	State-listed	Rawlins Field Office Occurrence ²
Canada thistle	<i>Cirsium arvense</i>	✓	✓
Common burdock	<i>Arctium minus</i>	✓	✓
Common St. Johnswort	<i>Hypericum perforatum</i>	✓	UK
Common tansy	<i>Tanacetum vulgare</i>	✓	–
Dalmatian toadflax	<i>Linaria dalmatica</i>	✓	✓
Diffuse knapweed	<i>Centaurea diffusa</i>	✓	✓
Dyer's woad	<i>Isatis tinctoria</i>	✓	✓
Field bindweed	<i>Convolvulus arvensis</i>	✓	✓
Hoary cress	<i>Cardaria draba</i>	✓	✓
Houndstongue	<i>Cynoglossum officinale</i>	✓	✓

**TABLE E-2
STATE- AND COUNTY-LISTED NOXIOUS WEEDS IN WYOMING
FOR LANDS IN THE PROJECT AREA**

Common Name¹	Scientific Name	State-listed	Rawlins Field Office Occurrence²
Leafy spurge	<i>Euphorbia esula</i>	✓	✓
Musk thistle	<i>Carduus nutans</i>	✓	✓
Oxeye daisy	<i>Chrysanthemum leucanthemum</i>	✓	✓
Perennial pepperweed	<i>Lepidium latifolium</i>	✓	✓
Perennial sowthistle	<i>Sonchus arvensis</i>	✓	–
Plumeless thistle	<i>Carduus acanthoides</i>	✓	✓
Purple loosestrife	<i>Lythrum salicaria</i>	✓	UK
Quackgrass	<i>Elytrigia repens</i>	✓	–
Russian knapweed	<i>Acroptilon repens</i>	✓	✓
Russian olive	<i>Elaeagnus angustifolia</i>	✓	–
Salt cedar	<i>Tamarix chinensis, T. parviflora, and T. ramosissima</i>	✓	✓
Scotch thistle	<i>Onopordum acanthium</i>	✓	✓
Skeletonleaf bursage	<i>Ambrosia tomentosa</i>	✓	UK
Spotted knapweed	<i>Centaurea maculosa</i>	✓	✓
Yellow toadflax	<i>Linaria vulgaris</i>	✓	✓

SOURCES:¹Nomenclature follows Wyoming Weed and Pest Council 2012²Bureau of Land Management 2008a³Bureau of Land Management 2009a**NOTES:**

✓ = Indicates status as a state-listed noxious weed species or the presence of a state-listed species in a field office

UK = No populations of the species currently known in a field office

– = Field office has not surveyed for the species or the species was not mentioned in the corresponding management document

**TABLE E-3
DESIGNATED NOXIOUS WEEDS IN THE STATE OF COLORADO**

Common Name	Scientific Name	Common Name	Scientific Name
Absinth wormwood	<i>Artemisia absinthium</i>	Jointed goatgrass ¹	<i>Aegilops cylindrica</i>
African rue	<i>Peganum harmala</i>	Leafy spurge ¹	<i>Euphorbia esula</i>
Black henbane ¹	<i>Hyoscyamus niger</i>	Mayweed chamomile	<i>Anthemis cotula</i>
Bohemian knotweed	<i>Polygonum x bohemicum</i>	Meadow knapweed	<i>Centaurea pratensis</i>
Bouncingbet	<i>Saponaria officinalis</i>	Mediterranean sage	<i>Salvia aethiopsis</i>
Bulbous bluegrass	<i>Poa bulbosa</i>	Medusahead	<i>Taeniatherum caput-medusae</i>
Bull thistle ¹	<i>Cirsium vulgare</i>	Moth mullein	<i>Verbascum blattaria</i>
Camelthorn	<i>Alhagi pseudalhagi</i>	Musk thistle ¹	<i>Carduus nutans</i>
Canada thistle ¹	<i>Cirsium arvense</i>	Myrtle spurge	<i>Euphorbia myrsinites</i>
Cheatgrass/Downy brome	<i>Bromus tectorum</i>	Orange hawkweed	<i>Hieracium aurantiacum</i>
Chicory ¹	<i>Cichorium intybus</i>	Oxeye daisy ¹	<i>Chrysanthemum leucanthemum</i>
Chinese clematis	<i>Clematis orientalis</i>	Perennial pepperweed ¹	<i>Lepidium latifolium</i>
Common burdock ¹	<i>Arctium minus</i>	Perennial sowthistle	<i>Sonchus arvensis</i>
Common crupina	<i>Crupina vulgaris</i>	Plumeless thistle	<i>Carduus acanthoides</i>
Common mullein	<i>Verbascum thapsus</i>	Poison hemlock	<i>Conium maculatum</i>
Common St. Johnswort	<i>Hypericum perforatum</i>	Puncturevine	<i>Tribulus terrestris</i>
Common tansy	<i>Tanacetum vulgare</i>	Purple loosestrife ¹	<i>Lythrum salicaria</i>
Common teasel	<i>Dipsacus fullonum</i>	Quackgrass	<i>Elytrigia repens</i>

TABLE E-3
DESIGNATED NOXIOUS WEEDS IN THE STATE OF COLORADO

Common Name	Scientific Name	Common Name	Scientific Name
Corn chamomile	<i>Anthemis arvensis</i>	Redstem filaree	<i>Erodium cicutarium</i>
Cutleaf teasel	<i>Dipsacus laciniatus</i>	Rush skeletonweed	<i>Chondrilla juncea</i>
Cypress spurge	<i>Euphorbia cyparissias</i>	Russian knapweed ¹	<i>Acroptilon repens</i>
Dalmatian toadflax- broad leaved ¹	<i>Linaria dalmatica</i>	Russian-olive	<i>Elaeagnus angustifolia</i>
Dalmatian toadflax- narrow leaved	<i>Linaria genistifolia</i>	Salt cedar ¹	<i>Tamarix chinensis</i> , <i>T. parviflora</i> , and <i>T. ramosissima</i>
Dame's rocket	<i>Hesperis matronalis</i>	Scentless chamomile	<i>Matricaria perforata</i>
Diffuse knapweed ¹	<i>Centaurea diffusa</i>	Scotch thistle ¹	<i>Onopordum acanthium</i>
Dyer's woad	<i>Isatis tinctoria</i>	Spotted knapweed ¹	<i>Centaurea maculosa</i>
Elongated mustard	<i>Brassica elongata</i>	Spurred anoda	<i>Anoda cristata</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	Squarrose knapweed	<i>Centaurea virgata</i>
Field bindweed	<i>Convolvulus arvensis</i>	Sulfur cinquefoil	<i>Potentilla recta</i>
Giant knotweed	<i>Polygonum sachalinense</i>	Tansy ragwort	<i>Senecio jacobaea</i>
Giant reed	<i>Arundo donax</i>	Velvetleaf	<i>Abutilon theophrasti</i>
Giant salvinia	<i>Salvinia molesta</i>	Venice mallow	<i>Hibiscus trionum</i>
Halogeton	<i>Halogeton glomeratus</i>	Wild caraway	<i>Carum carvi</i>
Hoary cress ¹	<i>Cardaria draba</i>	Wild proso millet	<i>Panicum miliaceum</i>
Houndstongue ¹	<i>Cynoglossum officinale</i>	Yellow nutsedge	<i>Cyperus esculentus</i>
Hydrilla	<i>Hydrilla verticillata</i>	Yellow starthistle ¹	<i>Centaurea solstitialis</i>
Japanese knotweed	<i>Polygonum cuspidatum</i>	Yellow toadflax	<i>Linaria vulgaris</i>
Johnsongrass	<i>Sorghum halepense</i>		
SOURCE: Nomenclature follows Colorado Department of Agriculture 2012			
NOTE: ¹ Indicates a species known to occur in the BLM Grand Junction Field Office Bureau of Land Management 2012a			

TABLE E-4 STATE- AND COUNTY-LISTED NOXIOUS WEEDS IN UTAH FOR BUREAU OF LAND MANAGEMENT LANDS IN THE PROJECT AREA							
Common Name ¹	Scientific Name	Vernal Field Office Occurrence ²	Moab Field Office Occurrence ³	Price Field Office Occurrence ⁴	Richfield Field Office Occurrence ⁵	Fillmore Field Office Occurrence ⁶	Salt Lake Field Office Occurrence
Utah State-Listed Class A Weeds (Early Detection Rapid response)							
Black henbane	<i>Hyoscyamus niger</i>	✓	✓	✓	UK	—	—
Diffuse knapweed	<i>Centaurea diffusa</i>	✓	✓	—	✓	✓	✓
Johnsongrass	<i>Sorghum halepense</i>	UK	✓	—	✓	—	✓
Leafy spurge	<i>Euphorbia esula</i>	✓	—	—	UK	—	✓
Medusahead	<i>Taeniatherum caput-medusae</i>	UK	—	—	UK	—	—
Oxeye daisy	<i>Chrysanthemum leucanthemum</i>	—	—	—	—	—	—
Purple loosestrife	<i>Lythrum salicaria</i>	✓	✓	✓	UK	✓	✓
Spotted knapweed	<i>Centaurea maculosa</i>	✓	✓	✓	UK	✓	✓
Squarrose knapweed	<i>Centaurea virgata</i>	UK	✓	—	X	✓	✓
St. Johnswort	<i>Hypericum perforatum</i>	—	—	—	UK	—	—
Sulfur cinquefoil	<i>Potentilla recta</i>	—	—	—	—	—	—
Yellow starthistle	<i>Centaurea solstitialis</i>	UK	—	—	UK	—	✓
Yellow toadflax	<i>Linaria vulgaris</i>	✓	✓	—	UK	—	—
Utah State-Listed Class B Weeds (Control)							
Bermudagrass	<i>Cynodon dactylon</i>	UK	✓	—	UK	—	✓
Dalmatian toadflax	<i>Linaria dalmatica</i>	UK	✓	—	UK	—	—
Dyer's woad	<i>Isatis tinctoria</i>	✓	✓	—	UK	✓	✓
Hoary cress	<i>Cardaria draba</i>	✓	✓	✓	✓	✓	✓
Musk thistle	<i>Carduus nutans</i>	✓	✓	✓	✓	✓	✓
Poison hemlock	<i>Conium maculatum</i>	UK	✓	—	—	—	—
Perennial pepperweed	<i>Lepidium latifolium</i>	✓	✓	✓	✓	—	✓
Russian knapweed	<i>Acroptilon repens</i>	✓	✓	✓	✓	—	✓
Scotch thistle	<i>Onopordum acanthium</i>	✓	✓	✓	✓	—	✓
Utah State-Listed Class C Weeds (Containment)							
Canada thistle	<i>Cirsium arvense</i>	✓	✓	✓	✓	✓	✓
Field bindweed	<i>Convolvulus arvensis</i>	✓	✓	✓	✓	✓	✓
Houndstongue	<i>Cynoglossum officinale</i>	✓	✓	✓	—	—	—

**TABLE E-4
STATE- AND COUNTY-LISTED NOXIOUS WEEDS IN UTAH FOR BUREAU OF LAND MANAGEMENT LANDS IN THE PROJECT AREA**

Common Name ¹	Scientific Name	Vernal Field Office Occurrence ²	Moab Field Office Occurrence ³	Price Field Office Occurrence ⁴	Richfield Field Office Occurrence ⁵	Fillmore Field Office Occurrence ⁶	Salt Lake Field Office Occurrence
Salt cedar	<i>Tamarix chinensis</i> , <i>T. parviflora</i> , and <i>T. ramosissima</i>	✓	✓	✓	✓	—	—
Quackgrass	<i>Elytrigia repens</i>	✓	✓	—	✓	✓	✓
County-listed Weeds							
Blue flowering lettuce (Juab County)	<i>Lactuca tatarica</i>	—	—	—	—	✓	—
Common teasel (Uintah County)	<i>Dipsacus fullonum</i>						
Common reed (Washington County)	<i>Phragmites australis</i>	—	✓	—	—	—	—
Puncturevine (Uintah County)	<i>Tribulus terrestris</i>						
Russian-olive (Carbon, Duchesne, Grand, and Uintah counties)	<i>Elaeagnus angustifolia</i>	✓	✓	✓	UK	—	—
Water hemlock (Duchesne County)	<i>Cicuta maculata</i>	—	—	—	—	—	—

SOURCES:¹Nomenclature follows Utah Department of Agriculture and Food 2009, 2010.²Bureau of Land Management (BLM) 2008b³BLM 2008c⁴BLM 2008d⁵BLM 2008e⁶No inventories of noxious weeds have occurred in the particular BLM lands that would be crossed by the Project in this field office. Information for the BLM Fillmore Field Office was acquired from the U.S. Department of Agriculture (USDA) PLANTS database using a query of Utah state-listed noxious weeds that occur in Juab County, Utah (Natural Resource Conservation Service [NRCS] 2013a) For Juab County-listed noxious weeds, the presence of blue flowering lettuce was confirmed by the BLM Fillmore Field Office (Probert 2013).⁷No inventories of noxious weeds have occurred in the particular BLM lands that would be crossed by the Project in this field office. Information for the BLM Salt Lake Field Office was acquired from the USDA PLANTS database using a query of Utah state-listed noxious weeds that occur in Utah County, Utah (NRCS 2013b) as the only BLM-administered public lands potentially crossed by Project alternatives in the Salt Lake Field Office occur in this county (Watson 2013).**NOTES:**

✓ = Indicates status as a state-listed noxious weed species or the presence of a state- or county-listed species in a field office.

UK = No populations of the species are currently known within the field office.

— = Field office has not surveyed for the species or the species was not mentioned in the corresponding management document

TABLE E-5 STATE- AND COUNTY-LISTED NOXIOUS WEEDS IN UTAH FOR U.S. FOREST SERVICE LANDS IN THE PROJECT AREA				
Common Name ¹	Scientific Name	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest
Utah State-Listed Class A Weeds (Early Detection Rapid response)				
Black henbane	<i>Hyoscyamus niger</i>	✓		
Diffuse knapweed	<i>Centaurea diffusa</i>		✓	✓
Johnsongrass	<i>Sorghum halepense</i>			✓
Leafy spurge	<i>Euphorbia esula</i>	✓		✓
Medusahead	<i>Taeniatherum caput-medusae</i>			
Oxeye daisy	<i>Chrysanthemum leucanthemum</i>	✓		✓
Purple loosestrife	<i>Lythrum salicaria</i>			
Spotted knapweed	<i>Centaurea maculosa</i>	✓		✓
Squarrose knapweed	<i>Centaurea virgata</i>		✓	✓
St. Johnswort	<i>Hypericum perforatum</i>	✓		
Sulfur cinquefoil	<i>Potentilla recta</i>			✓
Yellow starthistle	<i>Centaurea solstitialis</i>			✓
Yellow toadflax	<i>Linaria vulgaris</i>	✓	✓	
Utah State-listed Class B Weeds (Control)				
Bermudagrass	<i>Cynodon dactylon</i>			
Dalmatian toadflax	<i>Linaria dalmatica</i>	✓	✓	✓
Dyer's woad	<i>Isatis tinctoria</i>	✓	✓	✓
Hoary cress	<i>Cardaria draba</i>	✓	✓	✓
Musk thistle	<i>Carduus nutans</i>	✓	✓	✓
Poison hemlock	<i>Conium maculatum</i>		✓	
Perennial pepperweed	<i>Lepidium latifolium</i>	✓		✓
Russian knapweed	<i>Acroptilon repens</i>	✓	✓	✓
Scotch thistle	<i>Onopordum acanthium</i>	✓	✓	✓
Utah State-listed Class C Weeds (Containment)				
Canada thistle	<i>Cirsium arvense</i>	✓	✓	✓
Field bindweed	<i>Convolvulus arvensis</i>			✓
Houndstongue	<i>Cynoglossum officinale</i>	✓	✓	✓
Salt cedar	<i>Tamarix chinensis</i> , <i>T. parviflora</i> , and <i>T. ramosissima</i>		✓	✓
Quackgrass	<i>Elytrigia repens</i>			✓
County-listed Weeds				
Blue flowering lettuce (Juab County)	<i>Lactuca tatarica</i>			
Common teasel (Uintah County)	<i>Dipsacus fullonum</i>			✓
Puncturevine (Uintah County)	<i>Tribulus terrestris</i>			✓
Russian-olive (Carbon, Duchesne, Grand, and Uintah counties)	<i>Elaeagnus angustifolia</i>	✓		✓
Water hemlock (Duchesne County)	<i>Cicuta maculata</i>			
SOURCE: U.S. Forest Service 2013a				
NOTES:				
¹ Nomenclature follows Utah Department of Agriculture and Food 2009, 2010.				
✓ = Indicates status as a state-listed noxious weed species or the presence of a state- or county-listed species in a National Forest.				

E.3 Migratory Birds

A variety of migratory bird species use habitats in the Project area for breeding, nesting, foraging, and migration. Migratory birds are protected under several statutes described in the Regulatory Framework for Wildlife Resources (Section 3.2.7.1).

BLM direction for the management and conservation of migratory birds is provided by Instruction Memorandum (IM) WY-2013-005 in Wyoming and IM CO-2011-007 in Colorado. In Utah, migratory bird conservation direction is provided by a Memorandum of Understanding WO-230-2010-04 between the BLM and FWS. At the Project level, the Memorandum of Understanding between BLM and the FWS requires BLM to identify birds that may occur in the Project area for consideration in analysis and development of potential conservation measures.

A list migratory birds that may occur in the Project area was developed from the FWS Birds of Conservation Concern for Bird Conservation Regions crossed by the Project. Additionally, Wyoming, Colorado and Utah Partners in Flight Physiographic Areas and Priority Species Lists were used to identify priority species and their potential breeding habitats in the Project area. Table E-6 lists the Partners in Flight Priority Species and the Birds of Conservation Concern species and their associated breeding habitats that could occur in the Project area.

E.4 Special Status Species Lists

Special status species include species listed as threatened, endangered, or candidates for listing under the Endangered Species Act (ESA), species listed as sensitive by the USFS, BLM, and species assigned a special status by the State of Wyoming, Colorado, or Utah. The species analyzed were compiled from lists of threatened, endangered, and candidate species from the FWS (county level), BLM sensitive species (state level), USFS sensitive species (forest level), or species protected by the States of Wyoming, Colorado, and/or Utah.

E.4.1 Federal Threatened, Endangered, and Candidate Species

- Wyoming – Carbon (FWS 2011a) and Sweetwater (FWS 2011b) counties
- Colorado – Garfield, Mesa, Moffat, and Rio Blanco counties (FWS 2011c)
- Utah – Carbon, Duchesne, Emery, Grand, Juab, Sanpete, Uintah, Utah, and Wasatch counties (FWS 2011d)

TABLE E-6
U.S. FISH AND WILDLIFE SERVICE BIRDS OF CONSERVATION CONCERN
AND PARTNERS-IN-FLIGHT PRIORITY SPECIES IN THE PROJECT AREA

Priority Species	Birds of Conservation Concern Species ¹	Partners in Flight Species	Partners in Flight North American Landbird Conservation Plan	Wyoming Partners in Flight (Physiographic Areas 62, 69, 86)	Colorado Partners in Flight (Physiographic Areas 62, 87)	Utah Partners in Flight (Physiographic Areas 69, 80, 86, 87)		
				Breeding Habitat	Breeding Habitat	Breeding Habitat I	Breeding Habitat II	Wintering Habitat
American avocet		✓	—	—	—	Wetland	Playa	Migrant
American bittern	✓		—	—	—	Wetland	Wetland	Migrant
American dipper		✓	—	—	High elevation riparian	Mountain riparian	Lowland riparian	Mountain riparian
American pipit		✓	—	—	Alpine tundra	Alpine	Wet meadow	Agriculture
American white pelican		✓	—	Wetlands	—	Water	Wetland	Migrant
Bald eagle	✓		Wetland	—	—	Lowland riparian	Agriculture	Lowland riparian
Band-tailed pigeon		✓	Mixed forest	Ponderosa pine	Ponderosa pine	Ponderosa pine	Mixed conifer	Migrant
Bendire's thrasher	✓		Western shrublands	—	—	Low desert scrub	Low desert scrub	Migrant
Black rosey-finch	✓	✓	—	—	—	Alpine	Alpine	Grassland
Black swift	✓	✓	Various	—	Cliff/Rock	Lowland riparian	Cliff	Migrant
Black-chinned hummingbird		✓	—	Pinyon-juniper	—	Pinyon-juniper	Mountain shrub	Migrant
Black-chinned sparrow	✓		Western shrublands	—	—	Low desert scrub	High desert scrub	Migrant
Black-necked stilt		✓		—	—	Wetland	Playa	Migrant
Black-throated gray warbler		✓	Mixed forest	Pinyon-juniper	—	Pinyon-juniper	Mountain shrub	Migrant
Blue grouse		✓	Coniferous forest	—	Mixed conifer	Sub-alpine conifer	Mountain shrub	Mixed conifer
Bobolink		✓	—	—	—	Wet meadow	Agriculture	Migrant
Boreal owl		✓	—	—	Spruce-fir	—	—	—
Brewer's sparrow	✓	✓	Western shrublands	Shrubsteppe/ Sagebrush shrubland	Sagebrush shrubland	Shrubsteppe	High desert scrub	Migrant
Broad-tailed hummingbird		✓	—	—	Aspen	Lowland riparian	Mountain riparian	Migrant

TABLE E-6
U.S. FISH AND WILDLIFE SERVICE BIRDS OF CONSERVATION CONCERN
AND PARTNERS-IN-FLIGHT PRIORITY SPECIES IN THE PROJECT AREA

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				Breeding Habitat	Breeding Habitat	Breeding Habitat I	Breeding Habitat II	Wintering Habitat
Brown-capped rosy finch	✓	✓	Tundra	–	Alpine tundra	–	–	–
Burrowing owl	✓	✓	–	Semidesert shrubland	–	High desert scrub	Grassland	Migrant
Calliope hummingbird	✓		Western shrublands	–	–	Mountain riparian	Mountain shrub	Migrant
Cassin's finch	✓		Coniferous forest	–	–	Aspen	Sub-alpine conifer	Lowland riparian
Cassin's kingbird		✓	–	Shrubsteppe/Pinyon-juniper	–	Lowland riparian	Pinyon-juniper	Migrant
Chestnut-collared longspur	✓		Grassland	–	–	–	–	–
Common poorwill		✓	–	Mountain shrubland	–	Pinyon-juniper	Lowland riparian	Migrant
Cordilleran flycatcher		✓	–	–	High elevation riparian	Sub-alpine conifer	Mountain riparian	Migrant
Eared grebe	✓		–	–	–	Wetland	Water	Water
Ferruginous hawk	✓	✓	–	Shrubsteppe	–	Pinyon-juniper	Shrubsteppe	Grassland
Flammulated owl	✓	✓	Mixed forest	–	Ponderosa pine	Ponderosa pine	Sub-alpine conifer	Migrant
Gambel's quail		✓	Western shrublands	–	–	Low desert scrub	Lowland riparian	Low desert scrub
Golden eagle	✓		–	–	–	Cliff	High desert scrub	High desert scrub
Grace's warbler	✓	✓	Mixed forest	Ponderosa pine	Ponderosa pine	Ponderosa pine	Mixed conifer	Migrant
Grasshopper sparrow	✓		Grassland	–	–	Grassland	Grassland	Migrant
Gray flycatcher		✓	Woodland	Pinyon-juniper	–	Pinyon-juniper	High desert scrub	Migrant
Gray vireo	✓	✓	Woodland	Pinyon-juniper	–	Pinyon-juniper	Oak	Migrant
Greater sage-grouse		✓	Western shrublands	Shrubsteppe	–	Shrubsteppe	Shrubsteppe	Shrubsteppe

**TABLE E-6
U.S. FISH AND WILDLIFE SERVICE BIRDS OF CONSERVATION CONCERN
AND PARTNERS-IN-FLIGHT PRIORITY SPECIES IN THE PROJECT AREA**

Priority Species	Birds of Conservation Concern Species ¹	Partners in Flight Species	Partners in Flight North American Landbird Conservation Plan	Wyoming Partners in Flight (Physiographic Areas 62, 69, 86)	Colorado Partners in Flight (Physiographic Areas 62, 87)	Utah Partners in Flight (Physiographic Areas 69, 80, 86, 87)		
				Breeding Habitat	Breeding Habitat	Breeding Habitat I	Breeding Habitat II	Wintering Habitat
Greater sage-grouse (columbia basin dps)	✓		—	—	—	—	—	—
Green-tailed towhee	✓	✓	Western shrublands	—	Mountain shrubland	Mountain shrub	High desert scrub	Migrant
Gunnison sage-grouse	✓	✓	Western shrublands	Sagebrush shrubland	—	Shrubsteppe	Shrubsteppe	Shrubsteppe
Hammond's flycatcher		✓	—	—	Spruce-fir	Sub-alpine conifer	Aspen	Migrant
Horned lark		✓	—	Semidesert shrubland	—	Grassland	High desert scrub	Grassland
Juniper titmouse	✓	✓	—	Pinyon-juniper	—	Pinyon-juniper	Pinyon-juniper	Pinyon-juniper
Lazuli bunting		✓	—	—	Lowland riparian	Lowland riparian	Mountain shrub	Migrant
Lewis's woodpecker	✓	✓	Riparian	Montane shrub/ Lowland riparian	Lowland riparian/ponderosa Pine	Ponderosa pine	Lowland riparian	Oak
Loggerhead shrike			—	Semidesert shrubland	—	High desert scrub	Pinyon-juniper	High desert scrub
Long-billed curlew	✓	✓	—	—	—	Grassland	Agriculture	Migrant
Lucy's warbler		✓	Woodland	—	—	Lowland riparian	Low Desert Scrub	Migrant
Macgillivray's warbler		✓	—	—	High elevation riparian	Lowland riparian	Mountain shrub	Migrant
Marbled godwit	✓		—	—	—	—	—	—
McCown's longspur	✓	✓	Grassland	Sagebrush grasslands	—	—	—	—
Mexican spotted owl		✓	—	Ponderosa pine	Ponderosa pine	Cliff	Lowland riparian	Cliff
Mountain plover	✓	✓	—	Sagebrush grasslands	—	High desert scrub	High desert scrub	Migrant

TABLE E-6
U.S. FISH AND WILDLIFE SERVICE BIRDS OF CONSERVATION CONCERN
AND PARTNERS-IN-FLIGHT PRIORITY SPECIES IN THE PROJECT AREA

Priority Species	Birds of Conservation Concern Species ¹	Partners in Flight Species	Partners in Flight North American Landbird Conservation Plan	Wyoming Partners in Flight (Physiographic Areas 62, 69, 86)	Colorado Partners in Flight (Physiographic Areas 62, 87)	Utah Partners in Flight (Physiographic Areas 69, 80, 86, 87)		
				Breeding Habitat	Breeding Habitat	Breeding Habitat I	Breeding Habitat II	Wintering Habitat
Northern harrier		✓	—	Wetlands	—	Wet meadow	High desert scrub	Agriculture
Northern sage grouse		✓	—	Sagebrush shrubland	Sagebrush shrubland	—	—	—
Olive-sided flycatcher	✓	✓	Coniferous forest	—	Spruce-fir	Sub-alpine conifer	Ponderosa pine	Migrant
Peregrine falcon	✓	✓	Various	Cliff/Rock	Cliff/Rock	Cliff	Lowland riparian	Wetland
Pinyon jay	✓	✓	Woodland	Pinyon-juniper	—	Pinyon-juniper	Ponderosa pine	Pinyon-juniper
Prairie falcon	✓	✓	—	Shrubsteppe	—	Cliff	High desert scrub	Agriculture
Purple martin		✓	—	—	Aspen	Aspen	Mixed conifer	Migrant
Red-naped sapsucker		✓	Mixed forest	—	Aspen	Aspen	Mixed conifer	Mountain riparian
Sage sparrow	✓	✓	Western shrublands	Shrubsteppe/ Sagebrush Shrubland	Sagebrush shrubland	Shrubsteppe	High desert scrub	Low desert scrub
Sage thrasher	✓	✓	Western shrublands	Shrubsteppe	—	Shrubsteppe	High Desert Scrub	Migrant
Scott's oriole		✓	Woodland	Pinyon-juniper	—	Low desert scrub	Pinyon-juniper	Migrant
Sharp-tailed grouse		✓	Western shrublands	—	—	Shrubsteppe	Grassland	Shrubsteppe
Short-eared owl		✓	Grassland	Wetlands	Wetlands	Wetland	Grassland	Agriculture
Snowy plover	✓		—		—	Playa	Playa	Migrant
Swainson's hawk	✓	✓	Grassland	Sagebrush grasslands	—	Agriculture	Aspen	Migrant
Three-toed woodpecker		✓	—	—	—	Sub-alpine conifer	Lodgepole pine	Sub-alpine conifer
Tricolored blackbird	✓		Wetland	—	—	—	—	—
Upland sandpiper	✓		—	—	—	—	—	—

TABLE E-6
U.S. FISH AND WILDLIFE SERVICE BIRDS OF CONSERVATION CONCERN
AND PARTNERS-IN-FLIGHT PRIORITY SPECIES IN THE PROJECT AREA

Priority Species	Birds of Conservation Concern Species ¹	Partners in Flight Species	Partners in Flight North American Landbird Conservation Plan	Wyoming Partners in Flight (Physiographic Areas 62, 69, 86)	Colorado Partners in Flight (Physiographic Areas 62, 87)	Utah Partners in Flight (Physiographic Areas 69, 80, 86, 87)		
				Breeding Habitat	Breeding Habitat	Breeding Habitat I	Breeding Habitat II	Wintering Habitat
Veery	✓		—	—	—	Lowland riparian	Lowland riparian	Migrant
Violet-green swallow		✓	—	—	Aspen	Mountain riparian	Aspen	Migrant
Virginia's warbler	✓	✓	Woodland	Montane shrub/ Mountain shrubland	Mountain shrubland	Oak	Pinyon-juniper	Migrant
Western bluebird		✓	—	Ponderosa pine	—	Ponderosa pine	Pinyon-juniper	Pinyon-juniper
Western kingbird		✓	—	Lowland riparian	—	Lowland riparian	Agriculture	Migrant
White-headed woodpecker	✓		Coniferous forest	—	—	—	—	—
White-tailed ptarmigan		✓		—	Alpine tundra	Alpine	Mountain riparian	Mountain riparian
White-throated swift		✓	Various	Cliff/Rock	—	Cliff	Cliff	Migrant
Willet		✓	—	—	Wetlands	Wetland	Wet meadow	Migrant
Williamson's sapsucker	✓	✓	Coniferous forest	—	Mixed conifer	Sub-alpine conifer	Aspen	Migrant
Willow flycatcher	✓		Riparian	—	—	Lowland riparian	Mountain riparian	Migrant
Wilson's phalarope		✓	—	Wetlands	—	Wetland	Water	Migrant
Wilson's warbler		✓	—	—	High elevation riparian	Mountain riparian	Alpine	Migrant
Yellow rail	✓		—	—	—	—	—	—
Yellow-billed cuckoo (in United States Distinct Population Segment)	✓	✓	—	—	—	Lowland riparian	Agriculture	Migrant

SOURCES: Colorado Partners in Flight 2012; U.S. Fish and Wildlife Service 2012b; Utah Partners in Flight 2012; Wyoming Partners in Flight 2012
 NOTES: ¹The Project area is located in Bird Conservation Regions 9, 10, and 16.

E.4.2 State Protected Species

- Wyoming
 - List of animals – Wyoming Game and Fish Nongame Species of Special Concern. January 2005 (Wyoming Game and Fish Department [WGFD] 2005a, b)
 - List of birds – Wyoming Game & Fish Nongame Species of Special Concern. January 2005 (WGFD 2005a)
- Colorado
 - List of animals – Colorado Threatened and Endangered List. July 7, 2010 (Colorado Parks and Wildlife [CPW] 2010)
- Utah
 - List of animals – Utah’s State Listed Species by County. March 29, 2011 (Utah Division of Wildlife Resources [UDWR] 2011a)

E.4.3 BLM Sensitive Species

- Wyoming – BLM Wyoming Sensitive Species Policy and List by Field Station (Rawlins). March 31, 2010 (BLM 2010a)
- Colorado – Colorado BLM State Director’s Sensitive Species List by Field Station (Little Snake, White River, Grand Junction). November 20, 2009 (BLM 2009b)
- Utah
 - List of animals – Utah BLM Sensitive Fish and Wildlife Species List. December 20, 2011 (UDWR 2011b)
 - List of plants – Interim BLM Sensitive Plant List, from State Office. February 1, 2011 (BLM 2011a)

E.4.4 USFS Sensitive Species

- Region 4 – Intermountain Region 4 (R4) Threatened, Endangered, Proposed, and Sensitive Species; Known and Suspected Distribution by Forest (USFS 2013a)

E.4.5 USFS Management Indicator Species

- Ashley National Forest – Ashley National Forest Land and Resource Management Plan (RMP) as amended (USFS 1986a)
- Manti-La Sal National Forest – Manti-La Sal National Forest Land and Resource Management Plan as amended (USFS 1986b)
- Uinta National Forest – Land and Resource Management Plan for the Uinta National Forest as amended (USFS 2003)

E.5 Special Status Species Tables

Special status plant species that are likely to occur in or near the Project area and were carried forward for detailed analysis in the EIS are included on Table E-7. Special status plants that were not carried forward for analysis are listed on Table E-8. Special status wildlife species that are likely to occur in or near the Project area and were carried forward for detailed analysis in the EIS are included on Table E-9. Special status wildlife species that were not carried forward for analysis are listed on Table E-10. These tables include a brief summary of the data available and the rationale used to determine which species were carried forward for detailed analysis.

TABLE E-7
SPECIAL STATUS PLANT SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Argyle Canyon phacelia	<i>Phacelia argylensis</i>				✓				The species occurs within 5 miles of transmission line alternative routes in the Uinta Basin (Bureau of Land Management [BLM] 2012d).
Barneby's cat's eye	<i>Cryptantha barnebyi</i>				✓				The species occurs within 1 mile of Link U241 (BLM 2012b).
Barneby ridge-cress	<i>Lepidium barnebyanum</i>	E							The species is known to occur in the Project area. The species is only known from a single population located on less than 500 acres. This population is approximately 3 miles from Links U402, U430, and U431 (U.S. Fish and Wildlife Service [FWS] 2011g).
Beaver Rim phlox	<i>Phlox pungens</i>		✓						The species is not known to occur in the Project area (Wyoming Natural Diversity Database [WYNDD] 2011). Suitable habitat for the species was modeled in the Project area (Fertig and Thurston 2003).
Bolander's camissonia	<i>Camissonia bolanderi</i>				✓				The species is known to occur in the Project area. Heritage data included occurrences of the species within 1 mile of Link U730 at Calf Mesa (Utah Natural Heritage Program [UNHP] 2012).
Caespitose cat's-eye	<i>Cryptantha caespitosa</i>			✓					The species is known to occur in the Project area. Heritage data included approximately 20 occurrences of the species within 5 miles of transmission line alternative routes in Utah and (Colorado Natural Heritage Program [CNHP] 2011; UNHP 2012).
Canyon sweet-vetch	<i>Hedysarum occidentale</i> var. <i>canone</i>						SS		The species is known to occur in the Project area in Carbon, Emery and Duchesne counties in Utah. Heritage data included one occurrence of the species near Tabiona approximately 7.5 miles from Link U420 (UNHP 2012).
Carrington daisy	<i>Erigeron carringtoniae</i>						SS		The species is known to occur in the Project area. Heritage data included thousands of individual occurrences of the species near Pine Spring in the East Mountains, which is approximately 0.5 mile from Link U630 (UNHP 2012).

TABLE E-7
SPECIAL STATUS PLANT SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Cedar Rim thistle	<i>Cirsium aridum</i>		✓						Suitable habitat was modeled near or in the Project area (Fertig and Thurston 2003) however, there are no known occurrences of the species in the Project area (WYNDD 2011). Based on discussions with agency specialists, it was determined that potentially suitable habitat for the species may or may not be present in the Project area (Blomquist 2012; Glennon 2012). Therefore, the species was carried forward for detailed analysis.
Cisco milkvetch	<i>Astragalus sabulosus</i> var. <i>sabulosus</i>	P			✓				The species is known to occur in the Project area. Heritage data included two occurrences of the species within 2.5 miles of Link U490 near the crossing of I-70 and Nash Wash southwest of Cisco, Utah (UNHP 2012).
Clay phacelia	<i>Phacelia argillacea</i>	E							The species is known to occur in the Project area along Links U539 and U530 (UNHP 2012).
Clay reed-mustard	<i>Schoenocrambe argillacea</i>	T							The species is known to occur in the Project area where Link U400 crosses the Green River (Franklin 1992).
Creutzfeldt's cat's-eye	<i>Cryptantha creutzfeldtii</i>				✓		SS		The species is known to occur in the Project area near Huntington and Kenilworth, Utah (Links U590, U630, and U765). The species also occurs northwest of Price, Utah (within 5 miles of Links U548Colorado, U595, U546, and U522) and near Soldier Creek (Links U522, U523, and U492) (CNHP 2011; UNHP 2012).
Debris milkvetch	<i>Astragalus detritalis</i>			✓					The species is known to occur in the Project area in Utah and Colorado. Several occurrences of the species have been documented in the past 30 years (BLM 2011b; CNHP 2011; UNHP 2012; WYNDD 2011).
Dense twinpod	<i>Physaria condensata</i>		✓						The species is not known to occur in the Project area (WYNDD 2011). Suitable habitat for the species was modeled in the Project area (Fertig and Thurston 2003).
Deseret milkvetch	<i>Astragalus desereticus</i>	T							The species is known to occur in the Project area. The only known population is crossed by the transmission line alternative route of Link U621 (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-7
SPECIAL STATUS PLANT SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Dolores River skeleton-plant	<i>Lygodesmia doloresensis</i>			✓	✓				The species is known to occur in the Project area. Heritage data included One recent occurrence of the species within 2 miles of transmission line alternative routes (CNHP 2011; UNHP 2012).
Duchesne milkvetch	<i>Astragalus duchesnensis</i>			✓					The species is known to occur in the Project area in proximity to transmission line alternative routes in Colorado (BLM 2011a, CNHP 2011).
Ephedra buckwheat	<i>Eriogonum ephedroides</i>			✓					The species is known to occur in the Project area. Heritage data included occurrences of the species near Link U240. The species also occurs north of Nine Mile Canyon (within 2.5 miles of Link U400) and in Dragon Canyon (within 3.2 miles of Link C196) (UNHP 2012).
Ferron's milkvetch	<i>Astragalus musiniensis</i>			✓					The species is known to occur in the Project area. Heritage data included occurrences of the species Colorado and Utah (CNHP 2011; UNHP 2012).
Gibben's beardtongue	<i>Penstemon gibbensii</i>		✓	✓					The species is known to occur in the Project area in Wyoming. Another population occurs in Browns Park National Wildlife Refuge, near the Colorado-Utah border. Suitable habitat for the species is located near transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011).
Goodrich's blazingstar	<i>Mentzelia goodrichii</i>				✓	SS			The species is known to occur in the Project area. Heritage data included occurrences of the species in the vicinity of Argyle Canyon near Links U431 and U401 (UNHP 2012, WYNDD 2011).
Goodrich's columbine	<i>Aquilegia scopulorum</i> var. <i>goodrichii</i>				✓				The species occurs within 1 mile of Link U431 (BLM 2012b).

TABLE E-7
SPECIAL STATUS PLANT SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Graham's beardtongue	<i>Penstemon grahamii</i>	PT		✓	✓				The species is known to occur in the Project area in Colorado and Utah. Heritage data included several occurrences of the species within 5 miles of transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011). Proposed critical habitat for the species also occurs in the Project area (78 <i>Federal Register</i> [FR] 47832-47858).
Graham's cat's-eye	<i>Cryptantha grahamii</i>				✓				The species occurs within 5 miles of transmission line alternative routes in the Uinta Basin (BLM 2012b).
Grand Junction suncup	<i>Camissonia eastwoodiae</i>			✓					The species is known to occur in the Project area. Heritage data included three populations within 2.5 miles of Link C270 (CNHP 2011).
Green River greenthread	<i>Thelesperma caespitosum</i>		✓		✓	SS			The species is known to occur in the Project area. Heritage and BLM data included three occurrences of the species within 1 mile of Links U404 and U401 (BLM 2012b; UNHP 2012; WYNDD 2011).
Hairy Townsend daisy	<i>Townsendia strigosa</i> var. <i>prolixa</i>				✓				The species occurs within 5 miles of transmission line alternative routes in the Uinta Basin (BLM 2012b).
Hamilton's milkvetch	<i>Astragalus hamiltonii</i>				✓				The species was recorded along Link U322 in 1981 (UNHP 2012). BLM-mapped potential habitat for the species is crossed by Links U410, U391, and U390 (BLM 2012b).
Horseshoe milkvetch	<i>Astragalus equisolensis</i>			✓	✓				The species is known to occur in the Project area. Heritage data included occurrences of the species near Green River, Utah (Links U310, U321, U322, U380 and U390) (BLM 2012b; CNHP 2011; UNHP 2012). BLM-mapped potential habitat for the species is crossed by Links U390 and U310 (BLM 2012b).
Huber's pepperwort	<i>Lepidium huberi</i>				✓				The species occurs within 5 miles of transmission line alternative routes in the Uinta Basin (BLM 2012b).
Jones' bluestar	<i>Amsonia jonesii</i>			✓					The species is known to occur in the Project area. Heritage data included occurrences of the species 1.5 miles from Link U390 (UNHP 2012). Heritage data included several other occurrences within 3 miles of Link C270 (CNHP 2011).

TABLE E-7
SPECIAL STATUS PLANT SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Jones' cycladenia	<i>Cycladenia humilis</i> var. <i>jonesii</i>	T							The species has not been recorded north of Interstate 80 in Utah. Heritage data did not include any occurrences of the species within 10 miles of transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011). The BLM Price Field Office conducted a study in 2012 to document distribution, identify habitat requirements and model the extent of suitable habitat of the species (Sansom and Elliot 2012). The results of the study indicated that potentially suitable habitat for the species could be present along Links U727, U728, U729, U730, U732, U733 and U734 in Emery County, Utah.
Laramie false sagebrush	<i>Sphaeromeria simplex</i>		✓						Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011). Suitable habitat for the species was modeled in the Project area (Fertig and Thurston 2003). Based on discussions with agency specialists, the species was carried forward for detailed analysis (Blomquist 2012).
Large-fruited bladderpod	<i>Lesquerella macrocarpa</i>		✓						The species is not known to occur in the Project area (WYNDD 2011). Suitable habitat for the species was modeled in the Project area (Fertig and Thurston 2003).
Ligulate feverfew	<i>Parthenium ligulatum</i>			✓					The species is known to occur in the Project area. Heritage data included occurrences of the species near Links C220 and U242 (CNHP 2011; UNHP 2012).
Meadow pussytoes	<i>Antennaria arcuata</i>		✓						The species is not known to occur in the Project area (WYNDD 2011). Suitable habitat for the species was modeled in the Project area (Fertig and Thurston 2003).
Narrowleaf evening primrose	<i>Oenothera acutissima</i>			✓					The species is known to occur in the Project area. Heritage data included occurrences of the species near Link U30 (CNHP 2011; UNHP 2012).
Narrow-stem gilia	<i>Gilia stenothyrsa</i>			✓					The species is known to occur within 1 mile of transmission line alternative routes near Links C186 and C196 in Colorado (BLM 2011a; CNHP 2011).

TABLE E-7
SPECIAL STATUS PLANT SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Ownbey's thistle	<i>Cirsium ownbeyi</i>		✓						The species is known to occur near the transmission line alternative routes in Utah and Colorado (BLM 2011a; CNHP 2011; UNHP 2012). Suitable habitat for the species is modeled in the Project area in Wyoming (Fertig and Thurston 2003).
Pariette cactus	<i>Sclerocactus brevispinus</i>	T							The species is known to occur in the Project area. The entire population of the species is within 5 miles of Links U400 and U402. Numerous occurrences of the species are within 1 mile of Link U402. (UNHP 2012). According to FWS a single population that occupies approximately 72,000 acres in the Pariette Draw encompasses the entire species (FWS 2011f).
Persistent-sepal yellowcress	<i>Rorippa calycina</i>		✓						The species is known to occur in the Project area. Heritage data included occurrences of the species along Link W30 (WYNDD 2011). Suitable habitat for the species was modeled in the Project area (Fertig and Thurston 2003).
Piceance bladderpod	<i>Lesquerella parviflora</i>			✓					The species is known to occur in the Project area. Heritage data included occurrences of the species within 20 miles of transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011).
Psoralea globemallow (Head sphaeromeria)	<i>Sphaeralcea psoraloides</i>				✓				The species is known to occur in the Project area. Heritage data included occurrences of the species along Link U730, west of the town of Green River. Data from the BLM, Price Field Office includes two populations of 15,000 individual plants. Heritage data did not include any other occurrences of the species within 35 miles of transmission line alternative routes (UNHP 2012).
Racemose milkvetch	<i>Astragalus racemosus</i> var. <i>treleasei</i>		✓						The species is not known to occur in the Project area (WYNDD 2011). Potentially suitable habitat for the species was modeled in the Project area (Fertig and Thurston 2003).
Rock hymenoxys	<i>Hymenoxys lapidicola</i>				✓				The species occurs within 5 miles of transmission line alternative routes in the Uinta Basin (BLM 2012b).

TABLE E-7
SPECIAL STATUS PLANT SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Rollins' cat's-eye	<i>Cryptantha rollinsii</i>			✓					The species is known to occur in the Project area. Heritage data included several occurrences of the species near transmission line alternative routes in Wyoming and Colorado (BLM 2011a; CNHP 2011; UNHP 2012; WYNDD 2011).
San Rafael cactus	<i>Pediocactus despainii</i>	E							The species is known to occur in the Project area. Heritage data included one small population near Furniture Draw, within 0.3 mile of Link U733. Other populations are within 5 miles of Link U730, U732, U733, and U734 (UNHP 2012).
Shrubby reed-mustard	<i>Schoenocrambe suffrutescens</i>	E							The species is known to occur in the Project area. FWS data included one occurrence of the species within 1 mile of Link U401 in the vicinity of Badlands Cliff/Wrinkles Road (FWS 2010). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Spanish bayonet	<i>Yucca harrimaniae</i> var. <i>sterilis</i>				✓				The species is known to occur in the Project area. Heritage data included seven known occurrences of the species, however, only one occurrence is less than 30 years old (2006) and is within 5 miles of Links U400 and U402 (UNHP 2012).
Stemless beardtongue	<i>Penstemon acaulis</i> var. <i>acaulis</i>		✓			SS			The species is not known to occur within 20 miles of transmission line alternative routes in Utah or Wyoming (UNHP 2012; WYNDD 2011) but does occur in proximity to transmission line alternative routes in Colorado (BLM 2011a). Potentially suitable habitat for the species was modeled in the Project area in Wyoming (Fertig and Thurston 2003).
Thompson's talinum	<i>Talinum thompsonii</i>				✓				The species is known to occur in the Project area. Heritage data included occurrences of the species within 5 miles of Links U732, U733, and U734 along Cedar Mountain. Heritage data indicates that the entire population may be within 5 miles of transmission line alternative routes (UNHP 2012).

TABLE E-7
SPECIAL STATUS PLANT SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Twisted buckwheat	<i>Eriogonum contortum</i>			✓					The species is known to occur in the Project area. Heritage data included occurrences of the species along Link U490 with additional occurrences near transmission line alternative routes in Utah and Colorado (CNHP 2011; UNHP 2012; WYNDD 2011).
Uinta Basin hookless cactus	<i>Sclerocactus wetlandicus</i>	T							The species is known to occur in the Project area. Heritage data included several occurrences of the species near transmission line alternative routes and more than 100 occurrences of the species in the Project area. One occurrence is within 0.5 mile of Link U402 (CNHP 2011; UNHP 2012; WYNDD 2011).
Uinta Basin spring-parsley	<i>Cymopterus duchesnensis</i>			✓					The species is known to occur in the Project area. Heritage data included occurrences of the species but most of them were more than 25 years old. None of the occurrences were within 1 mile of the transmission line alternative routes (CNHP 2011).
Untermann's daisy	<i>Erigeron untermannii</i>				✓	SS			The species is known to occur in the Project area. Heritage data included occurrences of two large populations located on the Ashley National Forest along Links U431 and U432 (CNHP 2011; UNHP 2012).
Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	T							The species is known to occur in the Project area. Heritage data included occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Western prairie fringed orchid	<i>Platanthera praecleara</i>	T							The species is found along the Platte River system and may be affected by water use in the Platte River watershed. The species is not known to occur near the Project area (CNHP 2011; UNHP 2012; WYNDD 2011) but could be indirectly affected by withdrawals of water from the Platte River basin for construction of the Project. Habitat for the species is not likely to be directly affected by the Project.

TABLE E-7
SPECIAL STATUS PLANT SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Wheeler's angelica	<i>Angelica wheeleri</i>							SS	The species is known to occur in the Project area. Heritage data included two occurrences at the junction of Salt Creek Canyon and McCune Canyon on the Uinta National Forest, which is approximately 5 miles from Link U650.
White River beardtongue	<i>Penstemon scariosus</i> var. <i>albifluvis</i>	PT		✓	✓				The species is known to occur in Uintah County, Utah and western Rio Blanco County, Colorado near the White River to the vicinity of Evacuation Creek and in the vicinity of Willow Creek (FWS 2011j). Populations located along the White River near the Utah-Colorado border are located near Links U240 and C220. Proposed critical habitat for the species also occurs in the Project area (78 FR 47832-47858).
SOURCE: Nomenclature follows U.S. Fish and Wildlife Service 2012c for federally listed Threatened and Endangered species and NatureServe Explorer NatureServe 2012 for all others. NOTES: Endangered Species Act C = Candidate E = Endangered P = Petitioned PT = Proposed Threatened T = Threatened U.S. Forest Service SS = Sensitive species with known habitat on the national forest									

TABLE E-8
SPECIAL STATUS PLANT SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Abajo daisy	<i>Erigeron abajoensis</i>						SS		The species is not known to occur in the Project area (Colorado Natural Heritage Program [CNHP] 2011; Utah Natural Heritage Program [UNHP] 2012).
Abajo Peak draba	<i>Draba abajoensis</i>						SS		The species is not known to occur in the Project area (CNHP 2011; UNHP 2012).
Ackerman's green gentian	<i>Frasera ackermaniae</i>				✓				The species is not known to occur in the Project area (UNHP 2012).
Alcove rock-daisy	<i>Perityle specuicola</i>				✓				The species is not known to occur within 10 miles of transmission line alternative routes (UNHP 2012).
Angell's cinquefoil	<i>Potentilla cottamii</i>				✓				The species is not known to occur in the Project area (UNHP 2012).
Arapien stickleaf	<i>Mentzelia argillosa</i>				✓				The species is not known to occur in the Project area (UNHP 2012).
Arctic poppy	<i>Papaver radicum</i>					SS			The species is not known to occur in the Project area (UNHP 2012; Wyoming Natural Diversity Database [WYNDD] 2011).
Arizona willow	<i>Salix arizonica</i>						SS		The species is not known to occur in the Project area (CNHP 2011; UNHP 2012).
Aromatic Indian breadroot	<i>Pedimelum aromaticum</i>			✓					The species is not known to occur within 15 miles of transmission line alternative routes (CNHP 2011).
Atwood's columbine	<i>Aquilegia atwoodii</i>				✓				The species is not known to occur in the Project area (UNHP 2012).
Barneby reed-mustard	<i>Schoenocrambe barnebyi</i>	E							The species is not known to occur in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Barneby woody aster	<i>Tonestus (=Aster) kingii</i> var. <i>barnebyana</i>							SS	The species is not known to occur in the Project area (UNHP 2012).
Bicknell milkvetch	<i>Astragalus consobrinus</i>								The species is not known to occur in the Project area (CNHP 2011; UNHP 2012).

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Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Blowout penstemon	<i>Penstemon haydenii</i>	E							The species is not known to occur in the Project area. Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011). The Project is located outside the U.S. Fish and Wildlife (FWS) range for the species.
Brownie ladyslipper	<i>Cypripedium fasciculatum</i>					SS			The species is not known to occur within 10 miles of transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011).
Burke's draba	<i>Draba burkei</i>								The species is not known to occur in the Project area (UNHP 2012).
Cache beardtongue	<i>Penstemon compactus</i>								The species is not known to occur in the Project area (UNHP 2012).
Canyonlands lomatium	<i>Lomatium latilobum</i>			✓	✓		SS		The species is not known to occur within 5 miles of transmission line alternative routes (CNHP 2011; UNHP 2012).
Cathedral Bluff dwarf gentian	<i>Gentianella tortuosa</i>			✓					The species is not known to occur within 20 miles of transmission line alternative routes (CNHP 2011).
Cathedral Bluff meadow-rue	<i>Thalictrum heliophilum</i>			✓					The species is not known to occur within 9 miles of transmission line alternative routes (CNHP 2011).
Cedar Mountain Easter daisy	<i>Townsendia microcephala</i>		✓						The species is not known to occur in the Project area (WYNDD 2011).
Chatterley onion	<i>Allium geyeri</i> var. <i>chatterleyi</i>						SS		The species is not known to occur in the Project area (CNHP 2011; UNHP 2012).
Cisco milkvetch B	<i>Astragalus sabulosus</i> var. <i>vehiculus</i>	P			✓				The species is not known to occur in the Project area (UNHP 2012).
Clay hill buckwheat	<i>Eriogonum viridulum</i>			✓					The species is not known to occur within 20 miles of transmission line alternative routes (CNHP 2011).

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SPECIAL STATUS PLANT SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Colorado hookless cactus	<i>Sclerocactus glaucus</i>	T							The species was recorded within 2 miles of Link C270 (CNHP 2001). All other occurrences of the species are at least 15 miles from the transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011). The occurrence within 2 miles of Link C270 is likely erroneous, and there are no verified occurrences within 25 miles of the transmission line alternative routes (Clayton 2012).
Cottam cinquefoil	<i>Potentilla cottamii</i>								The species is not known to occur in the Project area (UNHP 2012).
Cronquist daisy	<i>Erigeron cronquistii</i>								The species is not known to occur in the Project area (UNHP 2012).
Dainty moonwort	<i>Botrychium crenulatum</i>					SS		SS	The species is not known to occur in the Project area (UNHP 2012; WYNDD 2011).
DeBeque milkvetch	<i>Astragalus debequaeus</i>			✓					The species is not known to occur in the Project area (CNHP 2011).
DeBeque phacelia	<i>Phacelia submutica</i>	T							The species is not known to occur in the Project area (CNHP 2011).
Desolation Canyon columbine	<i>Aquilegia desolaticola</i>				✓				The species is not known to occur in the Project area (UNHP 2012).
Dudley Bluffs bladderpod	<i>Physaria congesta</i>	T							The species is not known to occur in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Dudley Bluffs twinpod	<i>Physaria obcordata</i>	T							The species is not known to occur in the Project area (FWS 2011h).
Dune wildrye	<i>Elymus simplex</i> var. <i>luxurians</i>		✓						The species is not known to occur in the Project area (WYNDD 2011).
Eastwood's monkeyflower	<i>Mimulus eastwoodiae</i>			✓					The species is not known to occur within 20 miles of transmission line alternative routes (CNHP 2011).
Entrada skeletonplant	<i>Lygodesmia entrada</i>				✓				The species is not known to occur within 5 miles of transmission line alternative routes (UNHP 2012).

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Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Fisher milkvetch	<i>Astragalus piscator</i>			✓					The species is not known to occur in the Project area (CNHP 2011).
Flat-top buckwheat	<i>Eriogonum corymbosum</i> var. <i>smithii</i>				✓				The species is not known to occur in the Project area (UNHP 2012).
Garrett bladderpod	<i>Lesquerella garrettii</i>							SS	The species is not known to occur in the Project area (UNHP 2012).
Garrett's fleabane	<i>Erigeron garrettii</i>							SS	The species is not known to occur in the Project area (UNHP 2012).
Giant fourwing saltbush	<i>Atriplex canescens</i> var. <i>gigantea</i>				✓				The species is not known to occur in the Project area (UNHP 2012).
Goodrich cleomella	<i>Cleomella palmeriana</i> var. <i>goodrichii</i>				✓				The species is not known to occur in the Project area (UNHP 2012).
Goodrich's penstemon	<i>Penstemon goodrichii</i>				✓				The species was recorded approximately 4 miles from Link U410 in 1979 (UNHP 2012). No other occurrences of the species have been recorded within 8 miles of transmission line alternative routes in the past 30 years (CNHP 2011; UNHP 2012; WYNDD 2011).
Graham columbine	<i>Aquilegia grahamii</i>					SS			The species is not known to occur in the Project area (UNHP 2012; WYNDD 2011).
Grand Junction milkvetch	<i>Astragalus linifolius</i>			✓					The species is not known to occur in the Project area (CNHP 2011).
Gypsum Valley cat's-eye	<i>Cryptantha gypsophila</i>			✓					The species is not known to occur within 35 miles of transmission line alternative routes (CNHP 2011).
Heliotrope milkvetch	<i>Astragalus montii</i>	T							The species is not known to occur within 25 miles of transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011).
Horse Canyon stickleaf	<i>Mentzelia multicaulis</i> var. <i>librina</i>				✓				The species is not known to occur within 5 miles of transmission line alternative routes (UNHP 2012).

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SPECIAL STATUS PLANT SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Isely's milkvetch	<i>Astragalus iselyi</i>	P			✓		SS		The species is not known to occur in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Jane's globemallow	<i>Sphaeralcea janeae</i>				✓				The species is not known to occur within 30 miles of transmission line alternative routes (UNHP 2012).
Jones' indigo-bush	<i>Psoralea polydenia</i> var. <i>jonesii</i>				✓				The species is not known to occur in the Project area (UNHP 2012).
Jones' Townsend daisy	<i>Townsendia jonesii</i> var. <i>lutea</i>				✓				The species is not known to occur in the Project area (UNHP 2012).
Kachina daisy	<i>Erigeron kachinensis</i>			✓			SS		The species is not known to occur in the Project area (CNHP 2011; UNHP 2012).
Laramie columbine	<i>Aquilegia laramiense</i>		✓						The species is not known to occur in the Project area (WYNDD 2011).
LaSal daisy	<i>Erigeron mancus</i>						SS		The species is not known to occur in the Project area (CNHP 2011; UNHP 2012).
Last Chance townsendia	<i>Townsendia aprica</i>	T							The species is not known to occur in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Lesser yellow lady's slipper	<i>Cypripedium parviflorum</i> (<i>Cypripedium calceolus</i> var. <i>parviflorum</i>)								The species is not known to occur within 20 miles of transmission line alternative routes (UNHP 2012).
Limber pine	<i>Pinus flexilis</i>		✓						The species is not known to occur in the Project area (WYNDD 2011).
Link Trail columbine	<i>Aquilegia flavescens</i> var. <i>rubicunda</i>						SS		The species was recorded 4.75 miles from Link U630 in 1972. No other occurrences of the species have been recorded in the Project area (CNHP 2011; UNHP 2012).

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SPECIAL STATUS PLANT SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Logan buckwheat	<i>Eriogonum loganum</i> (<i>E. brevicaulis</i> var. <i>loganum</i>)								The species is not known to occur in the Project area (UNHP 2012).
Maguire campion	<i>Silene petersonii</i>						SS		The species is not known to occur within 10 miles of transmission line alternative routes in the past 30 years (CNHP 2011; UNHP 2012).
Maguire draba	<i>Draba maguirei</i>								The species is not known to occur in the Project area (UNHP 2012).
Maguire's daisy	<i>Erigeron maguirei</i>				✓				The species is not known to occur within 15 miles of transmission line alternative routes within the past 30 years (UNHP 2012).
Meadow milkvetch	<i>Astragalus diversifolius</i>		✓						The species is not known to occur in the Project area (WYNDD 2011).
Musinea groundsel	<i>Senecio musiniensis</i>						SS		The species is not known to occur in the Project area (CNHP 2011; UNHP 2012).
Mussentuchit gilia	<i>Alicielia tenuis</i>				✓				The species is not known to occur in the Project area (UNHP 2012).
Naturita milkvetch	<i>Astragalus naturitensis</i>			✓					The species is not known to occur in the Project area (CNHP 2011).
Neese narrowleaf penstemon	<i>Penstemon angustifolius</i> var. <i>dulcis</i>				✓				The species is not known to occur within 5 miles of transmission line alternative routes (UNHP 2012).
Osterhout's cryptantha	<i>Cryptantha osterhoutii</i> (<i>Oreocarya osterhoutii</i>)			✓					The species is not known to occur in the Project area (CNHP 2011).
Parachute beardtongue	<i>Penstemon debilis</i>	T							The species is not known to occur in the Project area (CNHP 2011).
Park rockcress	<i>Arabis vivariensis</i>				✓				The species is not known to occur within 5 miles of transmission line alternative routes (UNHP 2012).

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Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Peabody milkvetch	<i>Astragalus pubentissimus</i> var. <i>peabodianus</i>				✓				The species is not known to occur in the Project area (UNHP 2012).
Petiolate wormwood	<i>Artemisia campestris</i> ssp. <i>borealis</i> var. <i>petiolata</i>					SS			The species is not known to occur in the Project area (UNHP 2012; WYNDD 2011).
Pinnate spring-parsley	<i>Cymopterus beckii</i>						SS		The species is not known to occur in the Project area (UNHP 2012; CNHP 2011).
Precocious milkvetch	<i>Astragalus proimanthus</i>		✓						The species is not known to occur in the Project area (WYNDD 2011).
Roan Cliffs blazingstar	<i>Mentzelia rhizomata</i> (<i>Nuttallia argillosa</i> , <i>Mentzelia argillosa</i>)			✓					The species is not known to occur within 20 miles of transmission line alternative routes (CNHP 2011).
Rock tansy	<i>Sphaeromeria capitata</i>			✓					The species was recorded 4.8 mile from Link C61 in 1983. No other occurrences of the species have been recorded in the Project area (WYNDD 2011).
Rockcress draba	<i>Draba globosa</i> (= <i>D. densifolia</i> var. <i>apiculata</i>)					SS		SS	The species is not known to occur within 4 miles of transmission line alternative routes (UNHP 2012; WYNDD 2011).
San Rafael milkvetch	<i>Astragalus rafaensis</i>			✓					The species is not known to occur within 5 miles of transmission line alternative routes in the past 30 years (CNHP 2011).
Santaquin draba	<i>Draba santaquinensis</i>							SS	The species is not known to occur in the Project area (UNHP 2012).
Shultz stickleaf	<i>Mentzelia shultziiorum</i>				✓				The species is not known to occur within 15 miles of transmission line alternative routes (UNHP 2012).
Singlestem buckwheat	<i>Eriogonum acaule</i>			✓					The species is not known to occur in the Project area (CNHP 2011).

TABLE E-8
SPECIAL STATUS PLANT SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Slender moonwort	<i>Botrychium lineare</i>					SS			The species is not known to occur within 1.5 miles of transmission line alternative routes in the last 60 years (UNHP 2012; WYNDD 2011). Surveys at the site in 2003 failed to locate the species (Franklin 2005).
Small rockcress (Fremont County rockcress)	<i>Boechera (Arabis) pusilla</i>	C	✓						The species is not known to occur in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Smith violet	<i>Viola franksmithii</i>								The species is not known to occur in the Project area (UNHP 2012).
Sweet-flowered rock jasmine	<i>Androsace chamaejasme</i> ssp. <i>carinata</i>						SS		The species is not known to occur in the Project area (CNHP 2011; UNHP 2012).
Trotter's oreoxis	<i>Oreoxis trotteri</i>				✓				The species is not known to occur within 15 miles of transmission line alternative routes (UNHP 2012).
Tufted fraseria	<i>Frasera paniculata</i>			✓					The species is not known to occur within 20 miles of transmission line alternative routes (CNHP 2011).
Uinta greenthread	<i>Thelesperma pubescens</i>		✓						The species is not known to occur in the Project area (UNHP 2012; WYNDD 2011).
Utah ivesia	<i>Ivesia utahensis</i>							SS	The species is not known to occur in the Project area (UNHP 2012).
Utah phacelia	<i>Phacelia utahensis</i>				✓				The species is not known to occur within approximately 4 miles of transmission line alternative routes in the past 80 years (UNHP 2012).
Utah spurge	<i>Euphorbia nephradenia</i>				✓				The species was recorded 3.3 miles from Link U730 in 1979. No other occurrences of the species have been recorded in the Project area (UNHP 2012).
Ward beardtongue	<i>Penstemon wardii</i>				✓				The species is not known to occur in the Project area (UNHP 2012).

TABLE E-8
SPECIAL STATUS PLANT SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Wasatch draba	<i>Draba brachystylis</i>								The species was recorded within 1 mile of Links U460 and U621 in 1901. No other recent occurrences of the species have been recorded in the Project area (UNHP 2012).
Wasatch fitweed	<i>Corydalis caseana</i> <i>spp. brachycarpa</i>							✓	The species is not known to occur in the Project area (UNHP 2012).
Wasatch jamesia	<i>Jamesia americana</i> <i>var. macrocalyx</i>							✓	The species is not known to occur within 15 miles of transmission line alternative routes (UNHP 2012).
Wasatch pepperwort	<i>Lepidium montanum</i> <i>var. alpinum</i>								The species is not known to occur in the Project area (UNHP 2012).
Wasatch shooting star	<i>Dodecatheon</i> <i>utahense</i>								The species is not known to occur in the Project area (UNHP 2012).
Winkler cactus	<i>Pediocactus winkleri</i>	T							The species is not known to occur in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Woodside buckwheat	<i>Eriogonum</i> <i>tumulosum</i>			✓					The species is not known to occur within 15 miles of transmission line alternative routes (CNHP 2011).
Wright fishhook cactus	<i>Sclerocactus</i> <i>wrightiae</i>	E							The species is outside of the range for the species identified by FWS in the 2008 status review of the species (FWS 2008a). The species is not known to occur within approximately 9 miles of transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-8
SPECIAL STATUS PLANT SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species			U.S. Forest Service Sensitive Species			Rationale
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	
Wyoming tansymustard	<i>Descurainia torulosa</i>		✓						The species is not known to occur in the Project area (WYNDD 2011). Suitable habitat for the species was modeled in the Project area (Fertig and Thurston 2003). However, based on discussions with agency specialists, it was determined that suitable habitat for the species is likely absent from the Project area (Glennon 2012). Therefore the species was not carried forward for detailed analysis.
SOURCE: Nomenclature follows FWS 2012f for federally listed Threatened and Endangered species and NatureServe Explorer NatureServe 2012 for all others. NOTES: Endangered Species Act C = Candidate E = Endangered P = Proposed T = Threatened U.S. Forest Service SS = Sensitive Species with known habitat on the national forest									

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
American beaver	<i>Castor canadensis</i>							MIS				Potentially suitable habitat for the species is present on the Uinta National Forest. The Project area is in the known range for the species (Smithsonian 2011). Heritage data did not include any occurrences of the species in the Project area (Colorado Natural Heritage Program [CNHP] 2011; Utah Natural Heritage Program [UNHP] 2012; WYNDD 2011).
American bittern	<i>Botaurus lentiginosus</i>								NSS3			The species is known to occur in the Project area. Heritage data included occurrences of the species at Stevies Lake, which is immediately west of Hanna, Wyoming, in 1985. No other occurrences of the species have been recorded in the Project area. Breeding Bird Survey and Christmas Bird Count report little, if any detection of the species in the Project area (Gough et al. 1998).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
American marten	<i>Martes americana</i>								NSS4			Portions of the Project area are in known range for the species (Wyoming Game and Fish Department [WGFD] 2010a). Heritage data included occurrences of the species in Flat Canyon in Manti-La Sal National Forest in 1954. Other occurrences of the species were recorded during surveys in the 1990s in the Taylor Mountain area of Ashley National Forest, which is located within approximately 20 miles from transmission line alternative routes (UNHP 2012; WYNDD 2011).
American pika	<i>Ochotona princeps</i>								NSSU			Portions of the Project area are in the species range in Utah and Wyoming (Smithsonian 2011). Heritage data included two occurrences of the species on the Manti-La Sal National Forest in the 1950s. Heritage data did not include any recent occurrences in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
American white pelican	<i>Pelecanus erythrorhynchos</i>			✓	SS						SPC	The species frequents lakes and reservoirs throughout the Project area during spring and fall migration. Heritage data included occurrences of the species in portions of the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Aquatic snails	Combined account								NSSU			Wyoming Heritage data for this group of species is lacking and little is known regarding distribution (WYNDD 2011). Aquatic snails are potentially present in portions of the Project area based on habitat requirements.
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>								NSS3			The species is known to occur in the Project area. Heritage data included occurrences of the species along Red Creek at Richards Gap (Links W492, W493 and W520). Wyoming Heritage data included three other occurrences of the species in the Project area along the Little Snake River near the Wyoming/Colorado border (WYNDD 2011).
Baird's sparrow	<i>Ammodramus bairdii</i>		✓									The species is known to occur in the Project area. Transient individuals of the species may occur in portions of the Project area during seasonal migration. Heritage data included two occurrences of the species (essentially the same location) along Link W30 in 1981 (WYNDD 2011).
Bald eagle	<i>Haliaeetus leucocephalus</i>		✓	✓	SS	SS	SS	SS	NSS2	SC	SPC	The species is known to occur in the Project area. The species is wide-ranging and suitable habitat exists in Wyoming, Colorado and Utah.

**TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS**

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Big brown bat	<i>Eptesicus fuscus</i>								NSS4			The entire Project area is in the known range of the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Big free-tailed bat	<i>Nyctinomops macrotis</i>				SS						SPC	The species is known to occur in the Project area. Summer range for the species occurs in the Project area in Utah (Bradley et al. 2006).
Bigmouth shiner	<i>Notropis dorsalis</i>								NSS4			Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011). The species was carried forward for analysis because it is known to inhabit the Platte River (U.S. Geological Survey [USGS] 2004).

**TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS**

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Black rosey finch	<i>Leucosticte atrata</i>								NSSU			Portions of the Project area are in the known range for the species (WGFD 2010a). Heritage data included one occurrence of the species near Crescent Junction, Utah in 1953 (Link U490). The species was observed at Buckhorn Wash, which is approximately 1 mile from Links U730 and U731. A flock was observed in 2002 at Bowrey Spring, which is approximately 1.5 miles from Link U90 (UNHP 2012). Heritage data did not include any occurrences of the species near the Project area in Wyoming (where the species is listed) (WYNDD 2011).
Black swift	<i>Cypseloides niger</i>				SS						SPC	Portions of the Project area are in the known range for the species. Potentially suitable breeding habitat for the species may occur around Utah Lake, which is near the Project area (Birds of North America 2005). Heritage data included one occurrence of the species in Utah at Red Creek near Fruitland in 1963 (UNHP 2012).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Black tern	<i>Chlidonias niger</i>								NSS3			Wyoming Game and Fish have mapped foraging and nesting colonies of the species in the Project area. Portions of the Project are located within suspected breeding areas for the species (WGFD 2010a). Wyoming Heritage data included one occurrence of the species at Hogback Lake, which is within 1 mile of the Project area (WYNDD 2011). Utah Heritage data included occurrences of the species near the Project area at Pelican Lake and Ouray National Wildlife Refuge (UNHP 2012).
Black-crowned night-heron	<i>Nycticorax nycticorax</i>								NSS3			Portions of the Project area are within known range for the species (Birds of North America 2005). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Black-footed ferret	<i>Mustella nigripes</i>	EX								FE/SE	S-ESA	The species could potentially occur in the Project area. Portions of the Project area are located near white-tailed prairie dog colonies with known populations of black-footed ferrets (U.S. Fish and Wildlife Service [FWS] 2008b).
Bluehead sucker	<i>Catostomus discobolus</i>		✓	✓	CA				NSS1		CS	The species is known to occur in the Project area. The species inhabits rivers crossed by transmission line alternative routes of the Project (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Bobolink	<i>Dolichonyx oryzivorus</i>				SS				NSS4		SPC	Most of the Project area in Wyoming is within the known range for the species (WGFD 2010a). Portions of the Project area in Utah and Colorado have potentially suitable habitat for the species. Heritage data included three occurrences of the species within 2 miles of the Project area; one occurrence of the species in Utah near Vernal (1963); one occurrence in Powell Park along the White River, west of Meeker; and one occurrence within 1 mile of the Project area along the Yampa River east of Craig (CNHP 2011; UNHP 2012; WYNDD 2011).
Bonneville cutthroat trout	<i>Oncorhynchus clarkii utah</i>				CA		SS	SS/MIS	NSS3		CS	Transmission line alternative routes are located near and/or cross known habitat for the species. Heritage data included occurrences of the species on the western end of Project in Utah (UNHP 2012).
Bonytail	<i>Gila elegans</i>	E				o	o	o		FE/SE	S-ESA	Transmission line alternative routes are located near and/or cross known habitat for the species. The species inhabits the Green, Yampa, and Colorado River systems which are crossed by transmission line alternative routes.

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Boreal toad	<i>Bufo boreas boreas</i>	Petitioned	✓	✓	CA	SS	SS	SS	NSS1	SE	SPC	Transmission line alternative routes are located near and/or cross potentially suitable habitat for the species. Heritage data included four records of specimens collected in Utah and Colorado within 1 mile of the Project area, but all are from approximately 50 years ago. No recent occurrences of the species have been recorded (CNHP 2011; UNHP 2012; WYNDD 2011). However, 110 individuals were translocated to Strawberry Reservoir, which is near the Project area in Utah.
Brassy minnow	<i>Hybognathus hankinsoni</i>								NSS4	ST		The Project area is within predicted range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011). The species was carried forward for analysis because it inhabits the Platte River system.
Brewer's sparrow	<i>Spizella breweri</i>		✓	✓					NSS4			The species is known to occur in the Project area. The species is wide ranging and occupies portions of the Project area during the breeding season (Birds of North America 2005). Heritage data included occurrences of the species in the Project area in Wyoming (CNHP 2011; UNHP 2012; WYNDD 2011).

**TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS**

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Brown-capped rosy finch	<i>Leucosticte australis</i>								NSSU			The Project area is within the predicted range for the species in Wyoming (WGFD 2010a). Portions of the Project area in Mesa County, Colorado, are on the fringe of the known range for the species (Birds of North America 2005; Johnson et al. 2000).
Burrowing owl	<i>Athene cunicularia</i>		✓		SS				NSSU	ST	SPC	The species is known to occur in the Project area. The species is wide ranging and suitable habitat exists in the Project area in Wyoming, Colorado and Utah (Birds of North America 2005). Heritage data included numerous occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Bushtit	<i>Psaltiriparus minimus</i>								NSS3			The Project area is within the known range for the species (Sloane 2001; WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
California floater	<i>Anodonta californiensis</i>								NSSU		SPC	The species is known to occur near the Project area. Heritage data included one occurrence of the species at Burraston Ponds south of Mona, Utah, which is within 1 mile of the terminus of the Project (UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Canvasback	<i>Aythya valisineria</i>								NSS3			Heritage data indicated that the specie is not known to occur in the Project area (WYNDD 2011). However, Christmas Bird Count and Breeding Bird Survey include occurrences of the species near water bodies in the Project area (Gough et al. 1998). Seasonal migrants of the species may occur in portions of the Project area.
Canyon mouse	<i>Peromyscus crinitus</i>								NSS3			The Project area is within known range for the species (Smithsonian 2011). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Caspian tern	<i>Hydroprogne caspia</i>								NSS3			The Project area is within predicted range for the species (WGFD 2010a). Heritage data included a single occurrence of the species in 1988 at Lake Boreham (Link U430), which is on the edge of the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Chestnut-collared longspur	<i>Calcarius ornatus</i>								NSS4			The species is known to occur near the Project area. Heritage data included recent occurrences of the species in the Project area in Wyoming (WYNDD 2011).
Clark's grebe	<i>Aechmophorus clarkii</i>								NSSU			The species is known occur in the Project area.

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Cliff chipmunk	<i>Tamias dorsalis</i>								NSS3			The Project area is within predicted range for the species (WGFD 2010a) and known range for the species (Smithsonian 2011). Heritage data did not include any occurrences of the species within 15 miles of transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011).
Colorado pikeminnow	<i>Ptychocheilus lucius</i>	E				o	o	o		FE/ST	S-ESA	Some transmission line alternative routes for the Project are located near and/or cross known habitat for the species. Spawning sites for the species are located in the Green and Yampa rivers, which are crossed by transmission line alternative routes (FWS 2002a). Heritage data included occurrences of the species in all three states (CNHP 2011; UNHP 2012; WYNDD 2011).
Colorado River cutthroat trout	<i>Oncorhynchus clarkii pleuriticus</i>		✓	✓	CA	SS/MIS	SS	SS/MIS	NSS2	SC	CS	Some transmission line alternative routes for the Project are located near and/or cross known habitat for the species. Heritage data included occurrences of the species near transmission line alternative routes in Utah and Colorado (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Columbia spotted frog	<i>Rana luteiventris</i>		✓		CA		SS	SS	NSS3		CS	Some transmission line alternative routes for the Project are located near and/or cross potentially suitable habitat for the species. Heritage data included occurrences of the species in the Project area in Utah within the past 10 years. Heritage data also included occurrences of the species along the San Pitch River near Mount Pleasant and north of Fairview (Links U631 and U600) and in the West Creek area south of Mona (Link U650) (CNHP 2011; UNHP 2012, WYNDD 2011).
Columbian sharp-tailed grouse	<i>Tympanuchus phasianellus columbianus</i>		✓	✓	SS				NSS4	SC	S-ESA	The species is known to occur near the Project area. Heritage data included occurrences of the species near Links C13 and C100 (CNHP 2011; UNHP 2012; WYNDD 2011).
Common loon	<i>Gavia immer</i>								NSS1			The species is not known to occur in the Project area nor the Platte River system (Birds of North America 2005). However, the Wyoming Wildlife Action Plan predicts that suitable habitat for the species may be present in the Project area (WGFD 2010a). Heritage data included one occurrence of the species near the Project area in 1978. A single individual was observed along the North Platte River south of the junction with Interstate 80 along Link W30 (WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Common shiner	<i>Luxilus cornutus</i>								NSS4	ST		The species is known to inhabit the Platte River system in eastern Wyoming (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Cornsnake	<i>Elaphe guttata</i>										SPC	The species inhabits areas along the Green River between Moab and Dinosaur National Monument (Bosworth 2003). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Desert bighorn sheep	<i>Ovis canadensis nelsoni</i>			✓			SS					Portions of the Project area are within designated suitable habitat for the species (Colorado Division of Wildlife [CDOW] 2006; Utah Division of Wildlife Resources [UDWR] 2005b; WGFD 2010a).
Devil crayfish	<i>Cambarus diogenes</i>								NSSU			The species is not known to occur in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011). However, distribution of the species is not well established. Therefore, the species was carried forward for analysis.
Dwarf shrew	<i>Sorex nanus</i>								NSS3			The Project area is within the known range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Eastern red bat	<i>Lasiurus borealis</i>								NSSU			The Project area is in the eastern edge of the predicted range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (WYNDD 2011).
Elk	<i>Cervus elaphus</i>					MIS	MIS					The species is known to occur within the Project area. Designated crucial habitats and migration corridors for the species are present in some portions of the Project area (CDOW 2006; UDWR 2005a; WGFD 2010a).
Eureka mountainsnail	<i>Oreohelix eurekaensis</i>										SPC	The species is known to occur near the Project area. Heritage data included occurrences of the species near transmission line alternative routes in the Red Narrows area on the southern end of Uinta National Forest. Other occurrences of the species are recorded near transmission line alternative routes (UNHP 2012).
Fairy and tadpole shrimp	Combined account								NSSU			The distribution of species in these groups is poorly understood. Heritage data did not include any occurrences of this group of species (CNHP 2011; UNHP 2012; WYNDD 2011). However, based on habitat requirements, the species could be present in portions of the Project area.

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Fatmucket	<i>Lampsilis siliquoidea</i>								NSSU			The Project area is outside the predicted range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011). The species was carried forward for analysis because it is known to inhabit the Platte River system.
Ferruginous hawk	<i>Buteo regalis</i>		✓	✓	SS				NSSU	SC	SPC	The species commonly occurs in the Project area.
Flammulated owl	<i>Otus flammeolus</i>					SS	SS	SS				The species is known to occur near the Project area. Heritage data included occurrences of the species in the Uinta Mountains. Heritage data included a single occurrence of the species north of Helper, Utah, in 1982 and older occurrences from the 1960s (CNHP 2011; UNHP 2012; WYNDD 2011).
Flannelmouth sucker	<i>Catostomus latipinnis</i>		✓	✓	CA				NSS1		CS	Some transmission line alternative routes for the Project are located near and/or cross known habitat for the species (CNHP 2011; UNHP 2012; WYNDD 2011).
Flathead chub	<i>Platygobio gracilis</i>								NSS4	SC		The species is not known to occur in the Project area. The species was carried forward for analysis because it is known to inhabit the Platte River system.

**TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS**

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Forster's tern	<i>Sterna forsteri</i>								NSS3			The species is known to occur in the Project area. Heritage data included three occurrences of the species southwest of Rawlins near Hogback Lake (Link W30) (CNHP 2011; UNHP 2012; WYNDD 2011).
Franklin's gull	<i>Leucophaeus pipixcan</i>								NSS3			According to the Wyoming Wildlife Action Plan, the Project area is within predicted range for the species (WGFD 2010a). However, Birds of North America indicates that the Project area is well outside known range for the species (Birds of North America 2005). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011). The species was carried forward for analysis because water bodies near the Project area exhibit characteristics of suitable habitat for the species and are within the range of the species.

**TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS**

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Fringed myotis	<i>Myotis thysanodes</i>		✓	✓	SS				NSS3		SPC	Heritage data did not include any known occurrences of the species in the Project area; however, some occurrences have been recorded within 10 miles of transmission line alternative routes in Utah (CNHP 2011; UNHP 2012; WYNDD 2011). The species was carried forward for analysis because portions of the Project area are located in suitable habitat for the species.
Golden eagle	<i>Aquila chrysaetos</i>					MIS	MIS					The species commonly occurs in the Project area.
Grasshopper sparrow	<i>Ammodramus savannarum</i>				SS				NSS4		SPC	Migrant individuals of the species may pass through the Project area in the summer, even though habitats in the Project area are considered marginal for the species. Heritage data included five occurrences of the species in the Uinta Basin (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Gray wolf	<i>Canis lupus</i>	SPC								FE/SE		Suitable habitats for the species are located in portions of the Project area. Utah Heritage data included two occurrences of the species near the Project area in Utah that were reported by members of the general public (UNHP 2012). Both observations were made in 1989 and may have been the same individual wolf. Wyoming Heritage data included one occurrence of the species in 2003 and was the first observation in the area in 22 years (WYNDD 2011). This observation was made by a WGFD employee.
Great Basin gopher snake	<i>Pituophis catenifer deserticola</i>								NSS2			The Project area is within the known range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Great Basin pocket mouse	<i>Perognathus parvus</i>								NSS3			The Project area is within the predicted range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area in the past 50 years. The closest recent occurrence of the species was recorded approximately 18 miles from transmission line alternative routes in 1990 (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Great Basin spadefoot	<i>Spea intermontana</i>		✓	✓					NSSU			The Project area is within the predicted range for the species (WGFD 2010a). Heritage data included occurrences of the species in the Project area in Wyoming and Colorado (CNHP 2011; UNHP 2012; WYNDD 2011).
Greater sage-grouse	<i>Centrocercus urophasianus</i>	C	✓	✓	CN	SS/MIS	SS	SS	NSS2	SC	S-ESA	The species is known to occur in the Project area in all three states and is heavily monitored (CNHP 2011; UNHP 2012; WYNDD 2011).
Greater sandhill crane	<i>Grus canadensis tabida</i>								NSS4	SC		The species is known to occur in the Project area. Portions of the Project area include suitable habitat for the species (CDOW 2006; WGFD 2010a). Heritage data included occurrences of the species along the North Platte River, Little Snake River, Yampa River, and in Routt National Forest (CNHP 2011; WYNDD 2011).
Greater short-horned lizard	<i>Phrynosoma hernandesi</i>								NSS4			The Project area is within predicted range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (WYNDD 2011).
Humpback chub	<i>Gila cypha</i>	E				o	o	o		FE/ST	S-ESA	The species is known to occur within the Project area. Heritage data included four known occurrences of the species that are crossed by or are in close proximity to transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Iowa darter	<i>Etheostoma exile</i>								NSS3	SC		The species is known to occur within the Project area. The species is found in the Yampa River near Dinosaur National Monument (USGS 2004).
Juniper titmouse	<i>Baeolophus ridgwayi</i>								NSS3			The species is known to occur in the Project area. Heritage data included ten occurrences of the species in the Project area along Links W492, W520, and W493 (CNHP 2011; UNHP 2012; WYNDD 2011). A Christmas Bird Count and Breeding Bird Survey report included occurrences of the species in Colorado and Utah (Gough et al. 1998).
Kit fox	<i>Vulpes macrotis</i>			✓	SS					SE	SPC	Portions of the Project area are within the known range for the species (CDOW 2006; UDWR 2005a). Heritage data included occurrences of the species in the Project area in Grand County, Utah, and Mesa County, Colorado (CNHP 2011, UNHP 2012).
Land snails	Combined account								NSSU			Wyoming Heritage data for this group of species is lacking and little is known regarding distribution (WYNDD 2011). Land snails are potentially present in portions of the Project area based on habitat requirements.

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Lark bunting	<i>Calamospiza melanocorys</i>								NSS4			The species may occur within the Project area in Wyoming during summer months. Heritage data included one occurrence of the species 20 years ago and two other observations from 1940 along Link U490 in Utah (UNHP 2012). Wyoming Heritage data did not include any occurrences of the species (WYNDD 2011).
Least chub	<i>Iotichthys phlegethontis</i>	C			CN						S-ESA/CS	A UDWR study referenced monitored populations of the species in Burraston Ponds near Mona, Utah, which is approximately 1 mile from Links U640 and U650 (Bailey et al. 2005).
Least tern (interior population)	<i>Sternula antillarum</i>	E								FE/SE		The species inhabits areas along the Platte River in Nebraska (Birds of North America 2005). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Lesser scaup	<i>Aythya affinis</i>								NSS3			The species was reported in the general Project area, but no detailed locations were available (Cook 1984). A Christmas Bird Count and Breeding Bird Survey report occurrences of the species near bodies of water in the Project area (Gough et al. 1998).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Lewis's woodpecker	<i>Melanerpes lewis</i>				SS				NSSU		SPC	Known breeding habitat for the species is located in portions of the Project area (Birds of North America 2005). Heritage data included occurrences of the species in the Project area along Nebo Creek and numerous occurrences of the species along the Green River (UNHP 2012).
Lincoln's sparrow	<i>Melospiza lincolnii</i>					MIS						The Project area is within known range of the species (Birds of North America 2005). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Little brown myotis	<i>Myotis lucifugus</i>								NSS4			The Project area is within predicted range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Loggerhead shrike	<i>Lanius ludovicianus</i>		✓									Known breeding habitat for the species is located in portions of the Project area (Birds of North America 2005). Heritage data included occurrences of the species in the Project area in Wyoming (CNHP 2011; UNHP 2012; WYNDD 2011).
Long-billed curlew	<i>Numenius americanus</i>		✓	✓	SS				NSS3	SC	SPC	The species is known to occur in the Project area (Birds of North America 2005).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Long-eared myotis	<i>Myotis evotis</i>		✓						NSS3			Portions of the Project area are within predicted range for the species (WGFD 2010b). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Long-legged myotis	<i>Myotis volans</i>								NSS3			The Project area is within predicted range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Long-nosed leopard lizard	<i>Gambelia wislizenii</i>			✓						SC		The species is known to occur in the Project area. Heritage data included several occurrences of the species in the Project area in Garfield and Mesa counties, Colorado (CNHP 2011).
Macroinvertebrates (aquatic)	Combined Account					MIS	MIS					Numerous species inhabit the waterways in the Project area.
McCown's longspur	<i>Calcarius mccownii</i>								NSS4			The species may breed and forage in grassland habitats near the Aeolus substation during the summer (Birds of North America 2005). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Merlin	<i>Falco columbarius</i>								NSSU			The species is known to occur within the Project area. Heritage data included relatively recent occurrences of the species along Muddy Creek (Link W111), east of Hogback Lake and along the North Platte River (Link W30) (WYNDD 2011).
Mexican spotted owl	<i>Strix occidentalis lucida</i>	T								FT/ST	S-ESA	The Project area is within the known range for the species (Birds of North America 2005). The Project area is outside designated critical habitat for the species. Potentially suitable habitat for the species may be present within portions of the Project area. Heritage data did not include any occurrences of the species within the Project (CNHP 2011; UNHP 2012; WYNDD 2011).
Milk snake	<i>Lampropeltis triangulum taylori</i>			✓								Distribution, range and recorded observations of this subspecies are lacking. Heritage data included occurrences of the species in Utah (UNHP 2012).
Moose	<i>Alces alces</i>								NSS4			The species is known to occur within the Project area. Portions of the Project area are within suitable habitats and range for the species.
Mountain plover	<i>Charadrius montanus</i>		✓	✓	SS				NSSU	SC	SPC	Portions of the Project area include known breeding areas for the species (Birds of North America 2005).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Mountain sucker	<i>Catostomus platyrhynchus</i>			✓						SC		Portions of the Project area in Colorado and Utah are within the known range for the species (Colorado Parks and Wildlife 2010); (Belica et al. 2006). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Mountain whitefish	<i>Prosopium williamsoni</i>								NSS4			The species inhabits the Yampa River system (WGFD 2010a), which is crossed by transmission line alternative routes. Heritage data included two occurrences of the species in the Yampa River near Hayden, Colorado (CNHP 2011; UNHP 2012; WYNDD 2011).
Mule deer	<i>Odocoileus hemionus</i>					MIS	MIS					The species is known to occur throughout the Project area. Portions of the Project area are within suitable habitats and range for the species.
Northern flying squirrel	<i>Glaucomys sabrinus</i>								NSS4			The Project area is on the extreme edge of predicted range for the species (WGFD 2010a). Wyoming Heritage data did not include any occurrences of the species in the Project area (WYNDD 2011). Utah Heritage data included one occurrence of the species from 1966 in Brook Meadow, which is approximately 10 miles northeast of Helper (UNHP 2012).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Northern goshawk	<i>Accipiter gentilis</i>		✓	✓	CA	SS/MIS	SS/MIS	SS/MIS	NSSU		CS	The species is known to occur within portions of the Project area. Heritage data included occurrences of the species, primarily on USFS lands throughout the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Northern leatherside chub	<i>Lepidomeda copei</i>		✓		CA				NSSU			The Utah Vertebrate Report included maps that indicate that the species may occur in the Project area (UNHP 2003). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Northern leopard frog	<i>Rana pipiens</i>		✓	✓					NSSU	SC		The species is known to occur within portions of the Project area. Heritage data included occurrences of the species in Utah (UNHP 2012).
Northern pintail	<i>Anas acuta</i>								NSS3			The species may occur near water habitats in the Project area, primarily in winter months. Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Northern plains killifish	<i>Fundulus kansae</i>								NSS4			The species is known to occur within the eastern Platte River system in Wyoming (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Northern tree lizard	<i>Urosaurus ornatus wrighti</i>								NSS1			The Project area is within known range for the species (WGFD 2010a; Stebbins 2003). Heritage data did not include any occurrences of the species in the Project area (WYNDD 2011).
Olive-backed pocket mouse	<i>Perognathus fasciatus</i>								NSS4			The species is known to occur within the Project area. Heritage data included occurrences of the species in the Project area (WYNDD 2011).
Oreohelix mountain snails	Combined account								NSSU			The distribution of this group of species is poorly understood but could be present in Project area based on habitat requirements. Wyoming Heritage data did not include any occurrences of the species for this group of species (WYNDD 2011).
Pale milksnake	<i>Lampropeltis triangulum multistriata</i>								NSS3			The Project area extends into the western edge of the predicted range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Pallid bat	<i>Antrozous pallidus</i>								NSS3			The Project area is within the known range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).

**TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS**

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Pallid sturgeon	<i>Scaphirhynchus albus</i>	E										The species is native to the Platte River in eastern Nebraska and is not known to occur in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011) but may be affected by water use within the Platte River watershed in Wyoming.
Peregrine falcon	<i>Falco peregrinus anatum</i>		✓	✓		SS	SS	SS	NSS3	SC		The species is known to occur within portions of the Project area. Heritage data included occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Pill clams	Combined account								NSSU			This group of species may be present in the Project area based on habitat requirements (WGFD 2010a). Wyoming Game and Fish indicates that pill clams could be present in some water systems in the Project area in Wyoming. Heritage data did not include any occurrences for this group of species (WYNDD 2011).
Pinyon mouse	<i>Peromyscus truei</i>								NSS3			The Project area is within known range for the species (Smithsonian 2011). Heritage data included one occurrence of the species in the Project area approximately 5 miles west of Baggs, Wyoming in 1977 (WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Piping plover	<i>Charadrius melodus circumcinctus</i>	T								FT/ST		The species has no designated critical habitat in the Project area. Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011). The species was carried forward for detailed analysis because it inhabits habitats along the Platte River system.
Plain pocketbook	<i>Lampsilis cardium</i>								NSSU			The Project area is outside predicted range for the species (WGFD 2010a). The species was carried forward for detailed analysis because it occurs in the Platte River system.
Plains black-headed snake	<i>Tantilla nigriceps</i>								NSSU			The Project area is within the predicted range for the species (WGFD 2010a). Other sources indicated that the Project area is outside known range for the species (Stebbins 2003). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Plains orangethroat darter	<i>Etheostoma spectabile</i>								NSSU	SC		The species occurs in the extreme eastern Platte River in Wyoming (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).

**TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS**

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Plains topminnow	<i>Fundulus sciadicus</i>								NSS3			The species occurs in the extreme eastern Platte River in Wyoming (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (WYNDD 2011).
Pond snails	Combined Account (<i>Stagnicola</i>)								NSSU			Wyoming Heritage data for this group of species is lacking and little is known regarding distribution (WYNDD 2011). This group of species was carried forward for detailed analysis because they are potentially present in portions of the Project area based on habitat requirements.
Pygmy nuthatch	<i>Sitta pygmaea</i>								NSSU			Project area is within predicted range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (WYNDD 2011).
Pygmy rabbit	<i>Brachylagus idahoensis</i>	SPC	✓		SS				NSS3		SPC	The species is known to occur within portions of the Project area (CDOW 2006; UDWR 2005a; WGFD 201ab). Heritage data included occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Razorback sucker	<i>Xyrauchen texanus</i>	E				o	o	o		FE/SE	S-ESA	The species is known to occur in the Project area in Utah and Colorado. The species inhabits the Green, Yampa, and Colorado River systems, which are crossed by transmission line alternative routes (FWS 2002b). Heritage data included occurrences of the species (CNHP 2011; UNHP 2012; WYNDD 2011).
Redhead	<i>Aythya americana</i>								NSS3			Winter migrants of the species may be present near areas of water in the Project area (Gough et al. 1998). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Red-naped sapsucker	<i>Sphyrapicus nuchalis</i>					MIS						The Project area is within known range for the species (Birds of North America 2005). Heritage data did not include any occurrences of the species in the Project area (UNHP 2012; WYNDD 2011).
Ringed crayfish	<i>Orconectes neglectus</i>								NSSU			The species inhabits the Platte River system (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (WYNDD 2011).
River otter	<i>Lontra canadensis</i>								NSSU	ST		The species is known to inhabit river systems in the Project area. Heritage data included occurrences of the species near Flaming Gorge, Wyoming (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Rocky Mountain bighorn sheep	<i>Ovis canadensis canadensis</i>					SS		SS	NSS4			The species is known to occur in the Project area. Potentially suitable habitat for the species is present within portions of the Project area.
Roundtail chub	<i>Gila robusta</i>		✓	✓	CA				NSS1	SC	CS	The species is known to inhabit river systems in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Sage sparrow	<i>Amphispiza belli</i>		✓						NSS4			The species is known to occur within portions of the Project area. Breeding habitat for the species is present in the Project area (Birds of North America 2005).
Sage thrasher	<i>Oreoscoptes montanus</i>		✓						NSS4			The species is known to occur within portions of the Project area. Wyoming Heritage data included occurrences of the species in the Project area (WYNDD 2011).
Short-eared owl	<i>Asio flammeus</i>				SS				NSS4		SPC	The species is known to occur within the Project area. Suitable habitat for the species is scattered throughout the Project area.
Smooth greensnake	<i>Opheodrys vernalis</i>								NSS3		SPC	Project area is within known range of the species (Redder et al. 2006). Utah Heritage data included one occurrence of the species near Current Creek at Link U420 (UNHP 2012).
Snowy egret	<i>Egretta thula</i>								NSS3			The species is known to occur along some waterways in the Project area in Wyoming (Birds of North America 2005).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Song sparrow	<i>Melospiza melodia</i>					MIS						The Project area is within known range for the species (Birds of North America 2005). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Southern Bonneville springsnail	<i>Pyrgulopsis transversa</i>										SPC	The species is known to occur in the Project area. Heritage data included occurrences of the species in Thistle Creek, near Link U625 (UNHP 2012).
Southern leatherside chub	<i>Lepidomeda aliciae</i>				CA		SS	SS			SPC	The species is known to occur in water systems in the Project area (UNHP 2012).
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	E								FE/SE	S-ESA	Portions of the Project area in Utah are within the breeding range of the species (Sedgwick 2000). Critical habitat for the species has been designated along the Colorado River, downstream from transmission line alternative routes (FWS 2005). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Spotted bat	<i>Euderma maculatum</i>		✓		SS	SS	SS	SS	NSS3		SPC	Suitable roosting and foraging habitats for the species are present in the Project area (Luce and Keinath 2007). Heritage data included one occurrence of the species along Chokecherry Creek on the Ashley National Forest; approximately 3 miles north of Link U401 (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Stonecat	<i>Noturus flavus</i>									SC		The species is known to inhabit the Platte River system, which is in the Project area (USGS 2004). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Suckermouth minnow	<i>Phenacobius mirabilis</i>								NSS2	SE		The species is known to inhabit the Platte River system, which is in the Project area (USGS 2004). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Swainson's hawk	<i>Buteo swainsoni</i>								NSSU			The species is known to occur within portions of the Project area. Heritage data included occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Three-toed woodpecker	<i>Picoides dorsalis</i>				SS	SS	SS	SS/MIS	NSSU		SPC	The Project area is within the known range for the species (Birds of North America 2005). Heritage data included one occurrence of the species in the Project area, near transmission line alternative routes, in 1930. A single adult was detected along Reservation Ridge during a playback survey in 1989. Two other adults were detected along Reservation Ridge in 1989. Links 513 and 515 are located along Reservation Ridge (Allen 2013; CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>		✓	✓	SS	SS	SS	SS	NSS2	SC	SPC	Suitable roosting and foraging habitats for the species are present in the Project area (Oliver 2000). Heritage data did not include any occurrences of the species within 1 mile of transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011).
Trumpeter swan	<i>Cygnus buccinator</i>		✓						NSS2			The species is occasionally present within portions of the Project area in Wyoming. Heritage data included one occurrence of the species at Hogback Lake in 1985 and one occurrence along Muddy Creek in 1997, which are both near Link W110 (WYNDD 2011).
Vagrant shrew	<i>Sorex vagrans</i>								NSS4			The Project area is outside the known range for the species according to North American Mammals online database (Smithsonian 2011). However, the Project area is within predicted range for the species according to the Wyoming Wildlife Action Plan (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Virginia rail	<i>Rallus limicola</i>								NSS3			Project area is within known range for the species (Birds of North America 2005).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Warbling vireo	<i>Vireo gilvus</i>					MIS						The Project area is within known range for the species (Birds of North America 2005). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Western red bat	<i>Lasiurus blossevillei</i>				SS						SPC	The Project area is at the eastern edge of species range (Smithsonian 2011). Heritage data included one occurrence of the species near Helper, Utah, in 1937 and one occurrence near Utah Lake in 1991 (UNHP 2012).
Western scrub-jay	<i>Aphelocoma californica</i>								NSS3			Breeding Bird Surveys and Christmas Bird Counts have identified occurrences of the species in Colorado and Utah (Gough et al. 1998). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Western small-footed myotis	<i>Myotis ciliolabrum</i>								NSS4			The Project area is within predicted range for the species (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>			✓	SS					SC		UDWR has identified habitat for the species in the Uinta Basin and south of the Book Cliffs (UDWR 2005a). Heritage data included one occurrence of the species within 1 mile of Link U490 in 2005. Heritage data included one other occurrence near Pelican Lake in 1963 (CNHP 2011; UNHP 2012; WYNDD 2011).
Western spiny softshell	<i>Apalone spinifera hartwegi</i>								NSS4			The species may occur within river systems in northern Carbon County, Wyoming (WGFD 2010a). Heritage data did not include any occurrences of the species in the Project area (WYNDD 2011).
White-faced ibis	<i>Plegadis chihi</i>		✓	✓					NSS3			Important habitats for the species are located within 4 miles of the Project area. Heritage data included occurrences of the species in the Project area in Wyoming and Colorado (CNHP 2011; UNHP 2012; WYNDD 2011).
White-tailed prairie dog	<i>Cynomys leucurus</i>	SPC	✓	✓	SS						SPC	The species is known to occur within the Project area. Heritage data included mapped colonies in Utah (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Whooping crane	<i>Grus americana</i>	E								FE/SE		The species is not known to occur in the Project area in Colorado (CNHP 2011). Heritage data included occurrences of the species in Utah in the 1970s but the species is not suspected to presently inhabit Utah (UNHP 2012). According to the Colorado Action Plan, the species is not known to have breeding populations in Colorado (CDOW 2006). The Project area is outside known range according to (Birds of North America 2005). Designated critical habitat for the species occurs downstream from the Project on the Platte River and may be affected by water use within the Platte River watershed.
Willow flycatcher	<i>Empidonax traillii</i>								NSS4			Portions of the Project area are within potentially suitable breeding habitats for the species (Birds of North America 2005). Heritage data did not include any occurrences of the species in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Wood frog	<i>Lithobates sylvaticus</i>								NSS2	SC		The Project area is within the predicted range for the species (WGFD 2010a). However, Heritage data indicated that the closest occurrence of the species is more than 40 miles away from transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-9
SPECIAL STATUS WILDLIFE SPECIES CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species			State Sensitive Species ²			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Wyoming pocket gopher	<i>Thomomys clusius</i>	SPC	✓						NSS3			The Project area is within known range and distribution of the species (WGFD 2010a). Heritage data included occurrences of the species in the Project area in Wyoming (WYNDD 2011).
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	PT	✓	✓	CN	SS	SS	SS	NSSU	SC	S-ESA	The species has been observed along various waterways in the Project area (Cеровski et al. 2004). Heritage data included occurrences of the species within and near Ouray National Wildlife Refuge (CNHP 2011; UNHP 2012; WYNDD 2011).

NOTES:

¹Listed by at least one of the Bureau of Land Management districts²Special status species in at least one state

Endangered Species Act

C = Candidate
 E = Endangered
 EX = Experimental/nonessential
 T = Threatened
 P = Proposed
 SPC = Species of Concern

Wyoming

NSSU = Native Species Status Unknown
 NSS# = Native Species Status – the lower the number, the greater the conservation need;
 NSS1-NSS4 = Species of Greatest Conservation Need

Bureau of Land Management

✓ = Sensitive species present in district
 CA = Conservation Agreement species
 CN = Candidate species
 SS = BLM Sensitive Species

Colorado

FE = Federally Endangered
 FT = Federally Threatened
 SE = State Endangered
 ST = State Threatened
 SC = State Special Concern (not a statutory category)

U.S. Forest Service

✓ = Potential habitat within Forest
 o = Off-site, primarily relates to downstream fish
 MIS = Management Indicator Species
 SS = Sensitive Species with known habitat on Forest

Utah

S-ESA = Sensitive as a result of being listed under the ESA
 CS = Conservation Agreement Species
 SPC = Species of Conservation Concern

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Abert's squirrel	<i>Sciurus aberti</i>						MIS					Abert's squirrel is an MIS on the Manti-La Sal National Forest. Abert's squirrel is a Utah State high interest species found only on the Monticello District in Utah (U.S. Forest Service [USFS] 1986b). The Monticello Ranger District of the Manti-La Sal National Forest is not in the Project or study area.
Allen's big-eared bat	<i>Idionycteris phyllotis</i>				SS						SPC	The Project area is outside of the predicted range for the species. The species occurs in extreme southern Utah with range extending only into southern Grand County (Utah Division of Wildlife Resources [UDWR] 2005b).
Arizona toad	<i>Bufo microscaphus</i>				SS							The Project area is outside of the predicted range for the species. The species occurs in extreme southwestern Utah (UDWR 2005a).
Arkansas darter	<i>Etheostoma cragini</i>									ST		The species is not known to occur in the Project area (Colorado Natural Heritage Program [CNHP] 2011). The species occurs in the Arkansas River east of Canon City, Colorado (almost 200 miles from the Project area) (U.S. Geological Survey [USGS] 2004).

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Barrow's goldeneye	<i>Bucephala islandica</i>								NSS3			The species is not known to occur in the Project area (WYNDD 2011). Breeding Bird Survey and Christmas Bird Count have not identified the species as occurring in the Project area (Gough et al. 1998). The Project area includes minimal habitat for the species based on Wyoming Game and Fish Department (WGFD) range map (WGFD 2010a).
Bear Lake sculpin	<i>Cottus extensus</i>										SPC	Predicted range for the species is outside the Project area (UDWR 2005a).
Black Hills red-bellied snake	<i>Storeria occipitomaculata pahasapae</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Black-backed woodpecker	<i>Picoides arcticus</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	SPC	✓							SC		Predicted range for the species is outside the Project area (Colorado Division of Wildlife [CDOW] 2006).

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2, 3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Boreal owl	<i>Aegolius funereus</i>					SS			NSS3			Potentially suitable habitat for the species occurs in the Project area but the species is not known to occur in the Project area. The species is known to occur within Uinta Mountains on the Ashley National Forest; suitable coniferous habitat does not occur on the portion of the Forest within the Project area. Heritage data included a single occurrence of the species in the Project area in Wyoming in 1989. However, the accuracy of the species identification has been questioned (Jorgensen 2013, Utah Natural Heritage Program [UNHP] 2012; Wyoming Natural Diversity Database [WYNDD] 2011).
Botta's pocket gopher	<i>Thomomys bottae rubidus</i>									SC		The species is not known to occur in the Project area (CNHP 2011). The species is known to occur in the eastern half of Colorado (CDOW 2006).
Burbot	<i>Lota lota</i>								NSS3			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Calico crayfish	<i>Orconectes immunis</i>								NSS4			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2, 3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
California condor	<i>Gymnogyps californianus</i>	E/X										The species has not been observed in the Project area. The Project area is approximately 120 miles from Lake Powell and portions of the Colorado River where the species has been reintroduced. The species would not be affected by the Project.
Canada lynx	<i>Lynx canadensis</i>	T								FT/SE	S-ESA	Colorado Parks and Wildlife reintroduced lynx in Colorado from 1999 to 2006. A predictive map of lynx habitat use in Colorado indicates that lynx could occupy habitats east of the Project in the Routt and White River National Forests (Colorado Parks and Wildlife 2012a). Both forests are located within the Project area but are not directly crossed by any of the Project alternatives. The natural lynx population in Utah has likely been extirpated; however released lynx have been tracked dispersing across northern Utah in the high Uinta Mountains, but none are known to have settled in Utah (UDWR 2005a). The Uinta-Wasatch-Cache National Forest contains designated lynx analysis units and linkage areas, though no lynx are known to occur on the forest (Jorgensen 2013). USFS announced that Canada lynx hair was found along Link U630 in the Manti-La Sal National Forest in 2002 (UDWR 2005a), though no lynx have been reported since.

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Canyon treefrog	<i>Hyla arenicolor</i>			✓								The species is not known to occur in the Project area. All occurrences of the species are located south of Interstate 70 (I-70) in Colorado, which is outside Project area (CNHP 2011). The known range for the species is south of Moab and Grand Junction (CDOW 2006; UDWR 2005a).
Cave physa	<i>Physella spelunca</i>								NSSU			The species is not known to occur in the Project area (WYNDD 2011). The species is only known to inhabit a single cave near Lovell, Wyoming (more than 200 miles north of the Project area) (WGFD 2010a).
Central stoneroller	<i>Campostoma anomalum</i>								NSS4			The species is not known to occur in the Project area (WYNDD 2011). Species does not occur in Carbon or Sweetwater counties (WGFD 2010a).
Common chuckwalla	<i>Sauromalus ater</i>				SS							The species is not known to occur in the Project area (UNHP 2012). The species occurs in the Mojave Desert, which is outside of the Project area (UDWR 2005a).
Common garter snake	<i>Thamnophis sirtalis</i>									SC		UNHP data included one occurrence within 1 mile of transmission line alternative routes at Seely Pond, which is north of Mount Pleasant, Utah (Link U631) (UNHP 2012). CNHP data included no occurrences of the species within Colorado (where the species is listed) (CNHP 2011). The Project area in Colorado is outside known range for the species (Stebbins 2003).

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Common king snake	<i>Lampropeltis getula</i>									SC		The species is not known to occur in the Project area (CNHP 2011). The species range only extends into the extreme southwestern corner of Colorado (CDOW 2006).
Coral Pink Sand Dunes tiger beetle	<i>Cicindela albissima</i>				CN							The Project area is outside the predicted range for the species (UDWR 2005a). The species is only known to occur in Kane County near Kanab, Utah (UDWR 2005a).
Couch's spadefoot	<i>Scaphiopus couchii</i>									SC		The species is not known to occur in the Project area (CNHP 2011). The species range only extends into the extreme southwestern corner of Colorado (AmphibiaWeb 2012).
Cylindrical papershell	<i>Anodontoides ferussacianus</i>								NSSU	SC		The species is not known to occur in the Project area (CNHP 2011; WYNDD 2011).
Dark kangaroo mouse	<i>Microdipodops megacephalus</i>				SS						SPC	The Project area is outside the known range for the species (Smithsonian 2011). The species is not known to occur in the Project area (UNHP 2012).
Desert iguana	<i>Dipsosaurus dorsalis</i>				SS							The species is not known to occur in the Project area (UNHP 2012). The species occurs in the Mojave Desert, which is outside of the Project area (UDWR 2005a).
Desert night lizard	<i>Xantusia vigilis</i>				SS							The species is not known to occur in the Project area (UNHP 2012). The species occurs in the Mojave Desert, which is outside of the Project area (UDWR 2005a).

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SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Desert sucker	<i>Catostomus clarkii</i>				SS							The species is not known to occur in the Project area (UNHP 2012). The species occurs in the Virgin River system, which is outside of the Project area (UDWR 2005a).
Dickcissel	<i>Spiza americana</i>								NSS4			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Finescale dace	<i>Phoxinus neogaeus</i>								NSS2			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Fisher	<i>Martes pennanti</i>							SS	NSSU			Predicted range for the species is outside the Project area in Wyoming (WGFD 2010a). The species is believed to be extirpated from Utah. Only one occurrence of the fisher has been reported in Utah. In 1938, fisher tracks were photographed near Trial Lake in Summit County, outside of the Project area. No other occurrences of the fisher in the state have been documented in Utah (UNHP 2012; WYNDD 2011).
Giant floater	<i>Pyganodon grandis</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Gila monster	<i>Heloderma suspectum</i>				SS							The species is not known to occur in the Project area (UNHP 2012). The species occurs in the Virgin River system, which is outside of the Project area (UDWR 2005a).

TABLE E-10
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Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Goldeye	<i>Hiodon alosoides</i>								NSS3			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Great Basin silverspot butterfly	<i>Speyeria nokomis nokomis</i>			✓								Predicted range for the species is outside the Project area (CDOW 2006). The species is not known to occur in the Project area (CNHP 2011).
Great Basin skink	<i>Plestiodon skiltonianus utahensis</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Great gray owl	<i>Strix nebulosa</i>					SS			NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (UNHP 2012; WYNDD 2011).
Great Plains earless lizard	<i>Holbrookia maculata maculata</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Great Plains narrowmouth toad	<i>Gastrophryne olivacea</i>									SC		Predicted range for the species is outside the Project area (AmphibiaWeb 2012). The species is not known to occur in the Project area (CNHP 2011)
Great Plains toad	<i>Bufo cognatus</i>				SS				NSSU		SPC	The species is believed to be extinct in Utah (Bosworth 2003) and is not known to occur in western Colorado or western Wyoming (CNHP 2011; UNHP 2012; WYNDD 2011).

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Greenback cutthroat trout	<i>Oncorhynchus clarkii stomias</i>	T								FT/ST		The species was discovered in Manti-La Sal National Forest in 2009 in Beaver Creek, a tributary to La Sal Creek (UDWR 2009a). Beaver Creek is on the southern end of the forest unit, outside the Project area. Heritage data did not include any known occurrences of the species in the Project area.
Grizzly bear	<i>Ursus arctos horribilis</i>	T								FT/SE	S-ESA	The predicted range for the species does not extend south of Yellowstone National Park (Smithsonian 2011). Heritage data included one occurrence from the 1870 and one occurrence from the "early 1900s" near transmission line alternative routes (CNHP 2011; UNHP 2012; WYNDD 2011).
Gunnison sage-grouse	<i>Centrocercus minimus</i>	C		X	CN					SC	S-ESA/CS	All occurrences of the species included in Heritage data were south of I-70. The Project area is north of I-70 and is approximately 8 miles from the closest occurrence (brood/nesting habitat). All occupied habitat and occurrences are south of the Colorado River. The Project area is north of the Colorado River (CNHP 2011; UNHP 2012).
Gunnison's prairie-dog	<i>Cynomys gunnisoni</i>				SS						SPC	Predicted range for the species is outside the Project area (UDWR 2006). All occurrences of the species are south of I-70 (UNHP 2012). Transmission line alternative routes are north of I-70 and are approximately 28 miles from the closest occurrence.

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2, 3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Harlequin duck	<i>Histrionicus histrionicus</i>								NSS3			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Hayden's shrew	<i>Sorex haydeni</i>								NSS4			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Hidden Forest Uinta chipmunk	<i>Neotamias umbrinus nevadensis</i>								NSS4			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Hispid pocket mouse	<i>Chaetodipus hispidus</i>								NSS3			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Hornyhead chub	<i>Nocomis biguttatus</i>		✓						NSS2			The species is not known to occur in the Project area (UNHP 2012). The species is believed to be extinct within the Platte River system. The species is found no further west than around Wheatland, Wyoming (Miller et al. 2005).
Idaho pocket gopher	<i>Thomomys idahoensis</i>		✓						NSS3			Predicted range for the species is outside the Project area (WGFD 2010b; Smithsonian 2011).
Jackson Lake springsnail	<i>Pyrgulopsis robusta</i>								NSSU			The predicted range for the species is outside the Project area in northwestern Wyoming (WGFD 2010a).

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2, 3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
June sucker	<i>Chasmistes liorus</i>	E						o			S-ESA	No known occurrences of the species exist in the 2-mile-wide study corridor (UNHP 2012). Sucker populations occur in tributaries of Utah Lake including the Provo River. It is probable that the June sucker once spawned in the Spanish Fork River, but irrigation depletions and habitat alteration have left this area uninhabited (FWS 1999a). Hobbie Creek is designated as critical habitat for June sucker on the Uinta National Forest (FWS 2012d). The Project does not cross the Hobbie Creek watershed, which is located approximately 13 miles north of transmission line alternative route.
Kendall Warm Springs dace	<i>Rhinichthys osculus thermalis</i>	E										Predicted range for the species is outside the Project area. The species occurs in Sublette County, Wyoming (WGFD 2010a).
Lake chub	<i>Couesius plumbeus</i>									SE		Predicted range for the species is outside the Project area (CDOW 2006). The species is not known to occur in the Project area (CNHP 2011). The species may occur in upper Green River above Flaming Gorge. The species does not occur in Colorado River watersheds in the Project area.
Least weasel	<i>Mustela nivalis</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Lesser prairie-chicken	<i>Tympanuchus pallidicinctus</i>									ST		Predicted range for the species is outside the Project area (CDOW 2006). The species is not known to inhabit areas west of the Rocky Mountains.
Massasauga	<i>Sistrurus catenatus</i>									SC		Predicted range for the species is outside the Project area (CDOW 2006). The species is not known to occur in the Project area (CNHP 2011). The species occurs in southern Colorado.
Mojave rattlesnake	<i>Crotalus scutulatus</i>				SS							The species is not known to occur in the Project area (UNHP 2012). The species occurs in the Mojave Desert, which is outside of the Project area.
Ninemile pyrg	<i>Pyrgulopsis nonaria</i>										SPC	Predicted range for the species is outside the Project area. The species is only known occur in springs near Nine Mile Reservoir south of Sterling, Utah (approximately 30 miles from the Project area) (Oliver and Bosworth 1999).
North American wolverine	<i>Gulo gulo luscus</i>	C				SS			NSS3	SE		Predicted range for the species is outside the Project area. The species may have been extirpated from Wyoming and Utah. (UDWR 2005a; WGFD 2010a). UNHP data included two occurrences of the species near Link U600 in Manti-La Sal National Forest. However, the sightings appear to have been contested (UNHP 2012).
Northern cricket frog	<i>Acris crepitans</i>									SC		The species is not known to occur in the Project area (CNHP 2011).

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SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

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			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Northern many-lined skink	<i>Plestiodon multivirgatus multivirgatus</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Northern myotis	<i>Myotis septentrionalis</i>								NSS3			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Northern pocket gopher	<i>Thomomys talpoides macrotis</i>									SC		The species is not known to occur in the Project area (CNHP 2010). Colorado GAP data indicated that the Project area is outside the range for the species.
Northern pygmy-owl	<i>Glaucidium gnoma californicum</i>								NSSU			Predicted range for the species is outside the Project area (Birds of North America 2005; (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Northern redbelly dace	<i>Phoxinus eos</i>									SE		Predicted range for the species is outside the Project area (USGS 2004). The species is not known to occur in the Project area (CNHP 2010).
Northern rubber boa	<i>Charina bottae</i>								NSS3			Predicted range for the species is outside the Project area in Wyoming (WYNDD 2011). Utah Heritage data included three occurrences of the species near the western end of the Project area in Utah (UNHP 2012).
Ornate box turtle	<i>Terrapene ornata ornata</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Pearl dace	<i>Margariscus margarita</i>								NSS2			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Pilose crayfish	<i>Pacifastacus gambelii</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Plains garter snake	<i>Thamnophis radix</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Plains harvest mouse	<i>Reithrodontomys montanus</i>								NSS3			Predicted range for the species is outside the Project area (Smithsonian 2011; WGFD 2010b). The species is not known to occur in the Project area (WYNDD 2011).
Plains hog-nosed snake	<i>Heterodon nasicus</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Plains leopard frog	<i>Rana blairi</i>									SC		Predicted range for the species is outside the Project area (CDOW 2006). The species is not known to occur in the Project area (CNHP 2011).
Plains minnow	<i>Hybognathus placitus</i>								NSS3	SE		Predicted range for the species is outside the Project area. The species is not known to occur in the Project area (CNHP 2011; WYNDD 2011).

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Plains pocket gopher	<i>Geomys bursarius</i>								NSS3			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Plains pocket mouse	<i>Perognathus flavescens</i>								NSS3			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Plains sharp-tailed grouse	<i>Tympanuchus phasianellus jamesii</i>									SE		Predicted range for the species is outside the Project area (CDOW 2006). The species is not known to occur in the Project area (CNHP 2011).
Plains spadefoot	<i>Spea bombifrons</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Prairie lizard	<i>Sceloporus consobrinus</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Prairie racerunner	<i>Aspidoscelis sexlineatus viridis</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Preble's shrew	<i>Sorex preblei</i>				SS				NSS3			Predicted range for the species is outside the Project area (Smithsonian 2011; WGFD 2010a). The species is not known to occur in the Project area (UNHP 2012; WYNDD 2011).

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Preble's meadow jumping mouse	<i>Zapus hudsonius preblei</i>	T								FT/ST		Predicted range for the species is outside the Project area (Smithsonian 2011; WGFD 2010a). The species is not known to occur in the Project area (CNHP 2011; WYNDD 2011).
Pygmy shrew	<i>Sorex hoyi</i>								NSS2			Predicted range for the species is outside the Project area. (Smithsonian 2011). The species is not known to occur in the Project area (WYNDD 2011).
Red-sided garter snake	<i>Thamnophis sirtalis parietalis</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Rio Grande chub	<i>Gila pandora</i>									SC		Predicted range for the species is outside the Project area (CDOW 2006). The species is not known to occur in the Project area (CNHP 2011).
Rio Grande cutthroat trout	<i>Oncorhynchus clarkii virginalis</i>	C								SC		Predicted range for the species is outside the Project area (CDOW 2006). The species is not known to occur in the Project area (CNHP 2011).
Rio Grande sucker	<i>Catostomus plebeius</i>									SE		Predicted range for the species is outside the Project area (CDOW 2006). The species is not known to occur in the Project area (CNHP 2011).
Rocky Mountain capshell	<i>Acroloxus coloradensis</i>									SC		Predicted range for the species is outside the Project area (CDOW 2006). The species is not known to occur in the Project area (CNHP 2011).
Roundtail horned lizard	<i>Phrynosoma modestum</i>									SC		The species is not known to occur in the Project area (CNHP 2011).

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Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Sauger	<i>Sander canadensis</i>								NSS3			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Shovelnose sturgeon	<i>Scaphirhynchus platyrhynchus</i>								NSS3			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Sidewinder	<i>Crotalus cerastes</i>				SS							Predicted range for the species is outside the Project area (UDWR 2005a). The species is not known to occur in the Project area (UNHP 2012).
Silky pocket mouse	<i>Perognathus flavus</i>				SS				NSS3			Predicted range for the species is outside the Project area (Smithsonian 2011; WGFD 2010a). The species is not known to occur in the Project area (UNHP 2012; WYNDD 2011).
Snake River cutthroat trout	<i>Oncorhynchus clarkii</i> spp.								NSS4			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Southern redbelly dace	<i>Phoxinus erythrogaster</i>									SE		The species is not known to occur in the Project area (CNHP 2011). The species occurs in the Arkansas River in the eastern half of Colorado.
Speckled rattlesnake	<i>Crotalus mitchellii</i>				SS							Predicted range for the species is outside the Project area (UDWR 2005a). The species is not known to occur in the Project area (UNHP 2012).

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SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2, 3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Spotted ground squirrel	<i>Spermophilus spilosoma</i>								NSS4			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Sturgeon chub	<i>Macrhybopsis gelida</i>								NSS1			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Swift fox	<i>Vulpes velox</i>		✓						NSS4	SC		Predicted range for the species is outside the Project area (Smithsonian 2011; Sovada et al. 2011; WGFD 2010a). The species is not known to occur in the Project area (CNHP 2011; UNHP 2012; WYNDD 2011).
Texas blind snake	<i>Leptotyphlops dulcis</i>									SC		The species is not known to occur in the Project area (CNHP 2011). The species is only known to occur in extreme southeastern Colorado (CDOW 2006).
Texas horned lizard	<i>Phrynosoma cornutum</i>									SC		The species is not known to occur in the Project area (CNHP 2011). The species is known to occur in southeastern Colorado (CDOW 2006).
Triploid checkered whiptail	<i>Cnemidophorus neotesselatus</i>									SC		The species is not known to occur in the Project area (CNHP 2011). The species is known to occur in southeastern Colorado (CDOW 2006).
Upland sandpiper	<i>Bartramia longicauda</i>								NSSU			The species is not known to occur in the Project area (WYNDD 2011).
Utah physa	<i>Physella utahensis</i>										SPC	The species was historically found in Utah Lake, but is believed to be extirpated. The only existing populations in Utah are in Box Elder County (Oliver and Bosworth 1999).

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Utah prairie-dog	<i>Cynomys parvidens</i>	T									S-ESA	Established range for the species is outside the Project area. Historic records indicate populations as far north as Sanpete County near Gunnison, which is approximately 30 miles from transmission line alternative routes (UDWR 2005a). The species is not known to occur in the Project area (UNHP 2012).
Valley garter snake	<i>Thamnophis sirtalis fitchi</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Virgin River spinedace	<i>Lepidomeda mollispinis mollispinis</i>				CA							Predicted range for the species is outside the Project area (UNHP 2012).
Water vole	<i>Microtus richardsoni</i>								NSS3			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Western banded gecko	<i>Coleonyx variegatus</i>				SS							Predicted range for the species is outside the Project area (UDWR 2005a).
Western painted turtle	<i>Chrysemys picta bellii</i>								NSS4			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Western pearlshell	<i>Margaritifera falcata</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).

TABLE E-10
SPECIAL STATUS WILDLIFE SPECIES NOT CARRIED FORWARD FOR ANALYSIS

Common Name	Scientific Name	Endangered Species Act	Bureau of Land Management Sensitive Species ¹			U.S. Forest Service Sensitive Species ^{2,3}			State Sensitive Species ⁴			Rationale and Nearest Known Location to the Project Area
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Western silvery minnow	<i>Hybognathus argyritis</i>								NSS2			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Western threadsnake	<i>Leptotyphlops humilis</i>				SS							Predicted range for the species is outside the Project area (UDWR 2005a).
White heel splitter	<i>Lasmigona complanata</i>								NSSU			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
White-tailed ptarmigan	<i>Lagopus leucura</i>					MIS						An introduced population of the species exists in the northern portion of Ashley National Forest, west of Flaming Gorge. However, predicted range for the species is outside the Project area (Birds of North America 2005). The species is not known to occur in the Project area (UNHP 2012; WYNDD 2011). Additionally, the Project area does not occur within high alpine meadows that are typical of white-tailed ptarmigan habitat (Birds of North America 2005).
Wyoming toad	<i>Anaxyrus baxteri</i>	E							NSS1			Predicted range for the species is outside the Project area (WGFD 2010b). The species is not known to occur in the Project area (WYNDD 2011).
Yellow mud turtle	<i>Kinosternon flavescens</i>									SC		The species is not known to occur in the Project area (CNHP 2011). The species range does not extend into western Colorado (CDOW 2006).

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			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest	Wyoming	Colorado	Utah	
Yellow-pine chipmunk	<i>Neotamias amoenus</i>								NSS4			Predicted range for the species is outside the Project area (WGFD 2010a). The species is not known to occur in the Project area (WYNDD 2011).
Yellowstone cutthroat trout	<i>Oncorhynchus clarkii bouvieri</i>				CA				NSS2			Predicted range for the species is outside the Project area (UDWR 2005a; WGFD 2010a). The species is not known to occur in the Project area (UNHP 2012; WYNDD 2011).
Zebra-tailed lizard	<i>Callisaurus draconoides</i>				SS							Predicted range for the species is outside the Project area (UDWR 2005a).

NOTES:

¹Listed by at least one of the Bureau of Land Management districts²Known habitat within at least one Forest³MIS species on at least one forest, but no known habitat⁴Special status species in at least one state

Endangered Species Act

E = Endangered
T = Threatened
E = Experimental/nonessential
C = Candidate
P = Proposed
SPC = Species of Concern

Wyoming

NSSU = Native Species Status Unknown
NSS# = Native Species Status – the lower the number, the greater the conservation need;
NSS1-NSS4 = Species of Greatest Conservation Need

Bureau of Land Management

✓ = Sensitive species present in district
CA = Conservation Agreement species
CN = Candidate species
SS = BLM Sensitive Species

Colorado

FE = Federally Endangered
FT = Federally Threatened
SE = State Endangered
ST = State Threatened
SC = State Special Concern (not a statutory category)

U.S. Forest Service

SS = Sensitive Species with known habitat on Forest
o = Off-site, primarily relates to downstream fish
MIS = Management Indicator Species

Utah

S-ESA = Sensitive as a result of being listed under the ESA
CS = Conservation Agreement Species
SPC = Species of Conservation Concern

E.6 Special Status Species Accounts

Special status species include plants or animals listed as threatened, endangered, or candidates for listing under the Endangered Species Act (ESA) as well as species assigned sensitive status by the USFS, BLM or the three states crossed by the Project.

Tables E-5 and E-7 include all of the special status plant and special status wildlife species that were carried forward for detailed analysis in the EIS. The known distribution, habitat requirements, and recent and historical locations for those species carried forward for analysis are detailed in the summaries below. The species accounts were compiled through review of scientific literature, agency reports, spatial data available from natural heritage programs, and collaboration with agency resource specialists. Species accounts for special status plant and wildlife that were not carried forward for analysis have not been included as these species will not be affected by the Project.

E.6.1 Special Status Plants

E.6.1.1 Federally Listed Threatened, Endangered, Candidate, and Proposed Plant Species

Barneby Ridge-cress (*Lepidium barnebyanum*) – FWS: Endangered

Regulatory Status

Barneby ridge-cress was first proposed for listing along with 1,700 other vascular plants on June 16, 1976 (41 *Federal Register* [FR] 24523). On December 10, 1979, the FWS withdrew the proposal, because it was not finalized within the 2-year time limit from the initial publication in the *Federal Register* (44 FR 70796). Beginning on October 13, 1983 and each successive year, the FWS made 1-year findings that the petition to list the species was warranted but precluded by other listing actions of higher priority. The final rule to list the species as endangered was published on September 28, 1990 (55 FR 39860). No critical habitat for Barneby ridge-cress has been designated to protect the species from potential vandalism that could occur if the specific geographical area of distribution was widely known. The FWS initiated a 5-year review on October 6, 2008 (73 FR 58261) and published their findings of the 5-year review in July 2011 (FWS 2011e).

The recovery plan for Barneby ridge-cress was published in 1993. The goals of the plan are to prevent the extinction and serious habitat degradation of the species and to downlist Barneby ridge-cress to threatened status. The species eventual recovery and delisting is uncertain. Downlisting criteria described in the plan includes: (1) existing stands and population numbers are maintained; (2) formal management designations for each of the three existing populations are established; (3) a total population of 20,000 individuals is documented for 5 years; and (4) five separate stands of at least 2,000 individuals are maintained (FWS 1993).

Taxonomy and Life History

Barneby ridge-cress, also known as Barneby's pepper-grass (UDWR 2005b), is a member of the mustard family, *Brassicaceae*. It was first discovered by Rupert Barneby in 1947 and later described as a subspecies of *Lepidium montanum* by Hitchcock in 1950. In 1967, James Reveal compared the type specimen to other samples and reclassified Barneby ridge-cress to a unique species, *Lepidium barnebyanum* (FWS 1993).

Barneby ridge-cress is a perennial herb. It grows to approximately half a foot tall and forms easily recognizable raised clumps up to 8 inches wide. It has a deep woody taproot with a smooth, hairless stem

and clumped leaves at the base of the plant. The flowers are cream-colored and 0.25 inches across. The flowers bloom in early May producing very small seeds that are shed from June through July (FWS 1993).

Distribution and Habitat Requirements

The known spatial distribution of Barneby ridge-crest has not changed since completion of the 1993 Recovery Plan. Barneby ridge-crest is known from one population with three separate stands endemic to thin limestone caps on ridge lines near Indian Canyon approximately 3 miles south and southwest of the town of Duchesne, Utah (FWS 2011e).

No new information concerning the demography of Barneby ridge-crest is available since FWS listed the species in 1990 and developed the Recovery Plan in 1993. In the Recovery Plan, FWS estimated the species' population at 5,000 individuals on about 500 acres of suitable habitat occurring entirely on the Ute Indian Tribe's Uintah and Ouray Reservation. Comprehensive surveys of Barneby ridge-crest were conducted in 2010 and 2011. Approximately 2/3 of known suitable habitat was surveyed, and 4,082 plants were counted. By extrapolating out to the rest of the known suitable habitat, the total population for the species was estimated to be approximately 6,000 individuals across approximately 500 acres of suitable habitat (FWS 2011e).

The species is a rare local endemic occurring solely on Tribal lands and access to the species and its habitat is limited. The species' plant community is comprised of small statured shrubs and semi-woody cushion plants on infrequently occurring limestone barrens within broader woodlands dominated by Utah juniper (*Juniperus osteosperma*) and pinyon pine (*Pinus edulis*). The limestone substrate where Barneby ridge-crest grows has the appearance of highly weathered concrete. This particular limestone barren is an unnamed geological stratum of the geologic Uinta Formation. The species is restricted to that stratum. Barneby ridge-crest is an edaphically (soil related) controlled endemic of the Uinta Basin (Welsh et al. 2003).

Primary Threats to Survival

The primary threat to the survival of Barneby ridge-crest is damage due to oil and gas exploration. Ridge-crest habitat is underlain by petroleum deposits with current and potential future development and the potential for significant loss from petroleum resource development is high. The listing of the species as endangered has made huge strides in protecting its habitat from oil and gas development activities (FWS 1993). The recovery plan cites Barneby ridge-crest as being threatened by vehicular impacts due to its narrow distribution along ridgelines. Since the species' listing in 1990, recreational (trail riding and hunting related) off-highway vehicle (OHV) use within the species' occupied habitat has been very light due in large part to Tribal control and active policing to prevent trespass. Therefore, FWS considers the threat of recreational OHV to be low throughout the species' range. Listing under the ESA provides the Tribe an increased awareness of the species' vulnerability and provides the ability to further protect the species by reinforcing laws and regulations pertaining to violations of trespass laws (FWS 2011e). Livestock grazing was reported as a concern in the recovery plan for adverse impact to Barneby ridge-crest and its habitat. However, grazing is no longer allowed within Barneby ridge-crest habitat. Thus, although we do not know how much livestock grazing affected the species historically, we no longer consider livestock grazing to be a threat (FWS 2011e).

Occurrence in the Project Area

The single known population of Barneby ridge-crest is on the Uintah and Ouray Indian Reservation near the city of Duchesne, Utah. The location is near Indian Creek and Indian Canyon, approximately 3 miles

south of Starvation Reservoir (FWS 1993). The entirety of this population is located approximately 3 miles from the junction of Links U402, U430, and U431.

Cisco Milkvetch (*Astragalus sabulosus* var. *sabulosus*) – FWS: Petitioned; BLM: Utah

Regulatory Status

The full species (*Astragalus sabulosus*) was considered a category 2 candidate for listing in 1993 (58 FR 51152); however, the species was never listed. In 2009, the species was petitioned for listing and in their 90-day finding, the FWS determined that listing may be warranted (74 FR 41656). With that determination, the FWS began a status review to determine if listing is warranted. If it is determined that listing is warranted, the species will become a candidate.

Taxonomy and Life History

The Cisco milkvetch is a member of the pea family (*Fabaceae*) (Utah Native Plant Society [UNPS] 2012). The species was split into two varieties (*sabulosus* and *vehiculus*) in 1998 (Franklin 2005).

Cisco milkvetch have coarse leaves and pods with a stiff papery to leathery texture. Flowers are yellowish to whitish and approximately 1.25 inches in length. The variety *vehiculus* has flowers that are smaller and less yellow. The variety flowers from late March through early May (UNPS 2012).

Distribution and Habitat Requirements

This variety of Cisco milkvetch is endemic to the Grand River Valley in Grand County, Utah. It is only known to occur in the 20 miles between Cisco Mesa and Whipsaw Flat (Franklin 2005; UNPS 2012). The species is known from five locations occupying a total area of approximately 800 acres (74 FR 41656). Four extant populations of this variety are known from surveys conducted in 1995 and 1997. Two populations are located in Whipsaw Flat south of Thompson, one population is located along Bread Knolls, and one population approximately 4 miles southwest of Cisco (Utah Natural Heritage Program [UNHP] 2012). The Cisco milkvetch occurs on the Mancos Shale Formation in salt desert shrub communities from 4,250 to 5,250 feet (UNPS 2012). The species is highly dependent on sufficient moisture at the right time for seeds to germinate (Franklin 2005).

Primary Threats to Survival

Potential threats include off-road vehicles, energy development, oil and gas development, uranium mining, and natural gas development. In addition to the direct impacts these developments may have, the vibrations created may have an impact on the soils and plants in the vicinity of roads and developments (74 FR 41656).

Occurrence in the Project Area

All known occurrences of this variety lie within 4 miles of Link U490. Two occurrences are located within the 1-mile buffer of Link U490. One is located along Interstate 70 (I-70) approximately 2 miles west of Cisco. This occurrence is based on a museum collection from 1890, but surveys conducted in 1988 and 1995 failed to find any Cisco milkvetch present. The second occurrence is 4 miles southwest of Cisco along I-70. Surveys conducted in 1997 found 210 individuals occupying 5 acres (UNHP 2012).

Clay Phacelia (*Phacelia argillacea*) – FWS: Endangered

Regulatory Status

Clay phacelia was first proposed for listing on June 16, 1976, along with 1,700 other vascular plant species (41 FR 24523). On June 28, 1978, the FWS published a final rule listing clay phacelia as an endangered species (43 FR 44810). No critical habitat has been designated.

The recovery plan for clay phacelia was published in 1982 (FWS 1982). The objective of the plan is to establish a self-sustaining population of 2,000 to 3,000 individuals on 120 acres of protected habitat and possibly establish at least one new population. Once the objective is achieved, clay phacelia can possibly be downlisted, depending on the nature of the existing threats to the species. The FWS is currently re-evaluating recovery goals for clay phacelia to create more meaningful, measurable, and achievable recovery criteria (FWS et al. 2013).

Taxonomy and Life History

Clay phacelia is a member of the waterleaf family (*Hydrophyllaceae*) (UDWR 2005b). It was first collected in 1883 by Marcus E. Jones at Pleasant Valley Junction in Wasatch County, Utah and again in 1894 at Clear Creek near Soldier Summit in Utah County in 1894. However, Jones failed to recognize it as a new species. It was rediscovered in 1971 by N.D. Atwood who identified it as the closely related glandular phacelia (*Phacelia glandulosa*). However, on further examination, substantial differences were seen in the Utah populations and they were thus given unique species status (FWS 1982).

Clay phacelia is a winter annual that reaches heights of 12 inches. The stems are finely pubescent with pinnate leaves. The inflorescence is a compound cyme with blue to violet flowers. It germinates in the fall if there is significant moisture, but can germinate in the spring if conditions in fall are not wet enough. Flowering takes place in late May to early June and fruits are produced from mid-June to September and persist up to 2 weeks. Each fruit can contain up to four seeds. Pollen is primarily spread by wind and possibly bees (FWS 1982).

Dispersed seeds lodge in cracks or crevices on the shale-covered slopes where they germinate when conditions are suitable. Basal rosettes are formed by early to mid-October and they then over-winter growing slowly underneath the snow pack. Where they occur, the extant populations of clay phacelia cover only 3 to 5 percent of the slope's surface in scattered patches (FWS 1982). Overall vegetative cover is generally around 10 percent in habitat for the species (NatureServe 2013).

Distribution and Habitat Requirements

Historically, clay phacelia was known only from the two locations recorded by Jones in Pleasant Valley and Clear Creek. However, later searches were only able to locate the remaining population at Clear Creek near Soldier Summit in Utah County. The Pleasant Valley population remains to be rediscovered or has been eradicated since its initial discovery (UDWR 2005b).

In 1977, only nine plants were known to exist. This may have been occasioned by the construction of a railroad line directly through the population. By 1980 only four plants were left at the site due to trampling by sheep. The population was fenced off and the land was purchased by The Nature Conservancy. In 1989, a search turned up two subpopulations on open slopes approximately 5 miles west-northwest of the Clear Creek site. Today the species is stable but the remaining population totals only about 200 individuals. Clay phacelia is only found in the Spanish Fork Canyon of Utah (FWS 1982).

Clay phacelia grows on steep slopes in sparsely populated juniper-pinyon and mountain brush communities (Welsh et al. 1975). The slopes are very steep; a 70 percent grade at the largest population.

The substrate is described as “shaley clay colluviums” of the Green River Formation (Atwood 1975). As a result, the loose shale on the surface is continually sloughing down the face of the slopes. The majority of the plants grow on slopes facing west or southeast, at elevations between 6,000 and 7,000 feet. Populations are not likely to exist at elevations greater than 8,000 feet above mean sea level (UNPS 1989). Habitat areas are free of snow at least once during the winter and are typically dry in early spring. Associated vegetation includes skunkbush sumac (*Rush trilobata*) and Juneberry (*Amerlanichier alnifolia*) with a degraded sagebrush steppe at the base of the slope (FWS 1982). Overall, vegetation cover is generally around 10 percent in habitat for the species (NatureServe 2013).

Suitable habitat for clay phacelia has been modeled in the Project area by the USFS in the vicinity of known locations and a reintroduction sites. The habitat model for the species uses the parameters of slope, aspect, elevation, vegetative cover, geology, precipitation, and soil pH reported in literature for the species.

Primary Threats to Survival

The primary threat to the survival of clay phacelia is the vulnerability that results from such a drastically small population size. In populations with less than 1,000 individuals, demographic uncertainties can play a significant role in extinction probability. The species is a winter annual with habitat that faces restriction by climactic changes and soil factors. Destruction of portions of the population and modification of potential habitat has severely jeopardized clay phacelia. The Denver and Rio Grande Western Railroad and its associated maintenance road bisect the only known population. The railroad company is aware of the plant and has a positive attitude toward its protection. In addition, sheep moving through the area have trampled some of the plants and squirrels have caused considerable damage by grazing on portions of the plant (FWS 1982).

Occurrence in the Project Area

Clay phacelia is known to occur in the western portion of the Project area in Utah County. It has a population estimated at less than 200 individuals, all of which are known to occur in Spanish Fork Canyon of Utah. The species has been located in the vicinity of Tucker and down-canyon near Mill Fork (UDWR 2005b). Known occurrences of the species are in the Project area along Links U539 and U530. Twelve reintroduction sites for clay phacelia are located in Spanish Fork Canyon, and the USGS has collected and cultivated clay phacelia seeds in a greenhouse for use in reintroduction of the species at four of these sites. The USFS has documented emergence of plants at three of the four reintroduction sites; however, only one individual has been observed as having completed the biennial life cycle and successfully producing seeds.

Clay Reed-mustard (*Schoenocrambe argillacea*) – FWS: Threatened

Regulatory Status

Clay reed-mustard was first listed as a candidate to add to the list of endangered species on December 15, 1980 (45 FR 82480). Beginning on October 13, 1983 and each successive year, the FWS made 1-year findings that the petition to list the species was warranted but precluded by other listing actions of higher priority. On April 12, 1991, the FWS published a proposed rule proposing to list clay reed-mustard as an endangered species (56 FR 14910). Surveys for the species conducted after the proposal date revealed significant additional populations of the species, possibly twice as large as previously thought. Taking the new survey results into account, the FWS found it more appropriate to list clay reed-mustard as a threatened species (57 FR 1398). No critical habitat has been designated because the benefits of publicizing critical habitat are outweighed by the added dangers (57 FR 1398). The FWS initiated a 5-year review on October 6, 2008 (73 FR 58261). The FWS concluded the 5-year review and published the

summary and evaluation for the species on July 11, 2011. The FWS concluded that clay reed-mustard should retain its classification as a threatened species throughout its range, primarily due to threats associated with oil and gas development.

The recovery plan for the Utah reed-mustards was published in 1994. The goal of the plan is to delist clay reed-mustard. Delisting criteria described in the plan includes: (1) discovering or establishing a minimum of ten separate populations with 2,000 or more individuals per population; and (2) documenting or establishing formal land management designations that would provide for long-term protection on undisturbed habitat for the above ten populations (FWS 1994a).

Taxonomy and Life History

Clay reed-mustard, also known as clay Schoenocrambe and the Uinta Basin plainsmustard (UDWR 2005b), was discovered by Duane Atwood in 1976 on a site in the southern portion of the Uinta Basin in Uintah County, Utah, approximately 1 mile from the discovery site of the shrubby reed-mustard (*Schoenocrambe suffrutescens*). It was originally described as *Thelypodopsis argillacea*. In 1982, the genus was changed to *Schoenocrambe* by Rollins after evaluating the cruciferous genera that also includes the endangered shrubby reed-mustard (*Schoenocrambe suffretescens*) and Barneby reed-mustard (*Schoenocrambe barnebyi*) (FWS 1994a).

Clay reed-mustard is a perennial, herbaceous plant that reaches 1 foot in height. It has a wood root crown. It has alternate leaves arranged on the stem and are connected without a petiole. The flowers are pale lavender to white with prominent purple veins and grow to half an inch in length in a raceme of 3 to 20 flowers at the end of the plant's leafy stem (FWS 1994a).

All three species of reed-mustards flower from April to May with fruit appearing May to June. Reproduction is sexual and pollination is aided by insects. Little is known about the long-term population dynamics, disease, parasitism, effect of grazing, competition, and viability of any of the species (FWS 1994a).

Distribution and Habitat Requirements

Six populations of clay reed-mustard are known within a 19-mile range from the west side of the Green River to the east side of Willow Creek in southwestern Uintah County, Utah. One population is known from the eastern slopes of Big Pack Mountain; one in Broome Canyon to the east; a third is located along the west slopes of Wild Horse Bench; a fourth is immediately north in Long Bottom; a fifth is immediately north of Long Bottom called King's Bottom; and the sixth population is along the slopes of the canyons about Ray's Bottom, on the west side of the Green River. The total population is estimated from approximately 5,300 to 7,450 plants (FWS 2011i).

Clay reed-mustard grows in mixed salt desert shrub communities, generally on north-facing slopes composed of clay soils rich with gypsum overlain with sandstone talus. The sandstone talus of the clay reed-mustard is derived from a mixture of shales and sandstones from the zone of contact between the Uinta and Green River geologic formations. Populations grown on protected sites are generally more robust than those that grow on exposed surfaces (FWS 1994a). Associated vegetation includes crispleaf buckwheat (*Eriogonum corymbosum*), Torrey's jointfir (*Ephedra torreyana*), shadscale, valley saltbush, and saline wildrye (UDWR 2005b).

Primary Threats to Survival

Primary threats to clay reed-mustard include habitat disruption associated with energy development and off-road vehicle use. Most known populations are on federal lands that are leased for oil and gas energy

reserves and petroleum deposits that are being developed in adjacent habitats. In addition, the entire range of the species is underlain by oil shale (FWS 1994a). Most sites of clay reed-mustard contain less than 200 individuals, which increases the chance that populations may be lost as a result of natural variation in population numbers and less genetic diversity thus making the populations more susceptible to natural disasters (57 FR 1398-1403).

Occurrence in the Project Area

Clay reed-mustard inhabits areas in western Uintah County, Utah. There are six distinct populations. Two alternative routes (Links U117 and U400) cross a portion of the King's Bottom population and are within 1 mile of the Ray's Bottom population (FWS 2011i).

Deseret Milkvetch (*Astragalus desereticus*) – FWS: Threatened

Regulatory Status

Deseret milkvetch was first addressed in the July 1, 1975, indicating that the species was probably extinct (40 FR 27823). On June 16, 1976, the FWS published a proposed rule to designate 1,700 plants, including Deseret milk-vetch, as endangered species (41 FR 24523). On December 10, 1979, the FWS withdrew the proposal, because it was not finalized within the 2-year time limit from the initial publication in the *Federal Register* (44 FR 70796). In the December 15, 1980 notice of review, Deseret milkvetch was listed as a category 1 species, indicating that sufficient information on biological vulnerability and threats to support preparation of listing proposals was available. It was also noted that it was believed that Deseret milkvetch may have recently become extinct. In 1981, a population was discovered that led to a relisting as a Category 2 candidate, for which data was not sufficient to support issuance of a listing proposal (48 FR 53640). Surveys in 1990 and 1991 resulted in additional information that reinstated the Category 1 candidate assignment in 1993 (58 FR 51144). The species was eventually listed as a threatened species on October 20, 1999 (64 FR 56590).

On January 25, 2007, an advanced notice of proposed rulemaking was released announcing the intent to remove Deseret milkvetch from the federal list of endangered and threatened plants. Proposed delisting is occurring because threats to the species at the time of listing are not as significant as earlier believed and are managed such that the species is not likely to become in danger of extinction throughout all or a significant portion of its range in the foreseeable future (72 FR 3379). A 5-year review was initiated on April 18, 2007 (72 FR 19549). As of 2011, no critical habitat has been designated, no recovery plan has been published, and no official delisting has occurred for Deseret milkvetch. FWS did not find any threats to the species during the 5-year review process and therefore recommended delisting the species. However the FWS also noted that a single project, such as a major transmission line project, within or affecting occupied habitat could elevate the threats to the species to the point that it will not be able to be delisted (FWS 2011j).

Taxonomy and Life History

Deseret milkvetch is a member of the legume family (*Leguminosae*, *Fabaceae*). It was first collected near Indianola, Utah in 1893 and 1909 by Marcus E. Jones and Ivar Tidestrom, respectively. It was not described as a separate species until 1964 by Rupert Barneby using specimens from various herbaria. At that time, effort was made to find the original populations from which Jones and Tidestrom collected specimens, but they were unsuccessful. The species was believed to be extinct until found near Birdseye, Utah in 1981. This population is the only current known occurrence (64 FR 56590).

Deseret milkvetch is a perennial, herbaceous species that is nearly stemless and can reach a height of 6 inches. The flowers are typical of the bean family and are white with a purple tip on the keel. The seed

Pods are just under an inch long, hairy, and contain 14 to 16 seeds (64 FR 56590). Because the milkvetch is a short-lived perennial, it has no means of vegetative propagation. The survival of the species depends on successful reproduction and germination of seeds annually. Growth and reproduction begin after the annual snow melt, by mid-April (NatureServe 2008a). Flowering and seed setting occurs in May and June. Like most species in the pea family, the flower of Deseret milkvetch is primarily designed to be pollinated by bees. The seeds lay dormant over the winter and germinate in the spring when favorable conditions return (64 FR 56590).

Distribution and Habitat Requirements

Deseret milkvetch is endemic to central Utah and known from only one location on the east side of the Thistle Creek Valley near the town of Birdseye in Utah County (UDWR 2005b). The population consists of an estimated 86,775 to 98,818 individuals growing on 146 acres on both state and privately owned land (FWS 2011j). The known location of Deseret milkvetch is within an open to sparse juniper-sagebrush community on open, steep, naturally disturbed south and west (rarely north) facing slopes of sandy-gravelly soils of the Moroni Formation (UDWR 2005b). On west-facing road cuts, the individuals tend to grow larger. The vegetation is dominated by pinyon pine and Utah juniper. Other associated vegetation includes sagebrush, scrub oak, Indian ricegrass, antelope bitterbrush, and plateau beardtongue (*Penstemon scariosus*) (64 FR 56590).

Primary Threats to Survival

The primary threats to the survival of Deseret milkvetch are residential development, highway widening, and livestock grazing and trampling. The development of real estate adjacent to the single known population poses several threats. The construction could eliminate habitat or interfere with the reproductive success of the species. Increased real estate development would also increase recreational activities that could ultimately lead to decreased milk-vetch habitat. In addition, the limited population size makes the species more susceptible to dangers resulting from limited genetic diversity (64 FR 56590).

Although the distribution is still small and restricted, evidence shows that there has been little to no habitat disturbance in recent years and that there are no foreseeable potential threats to the State-owned portion of the species' range. Only one house has been built on private property within the species' range, affecting less than 1 percent of occupied habitat. As of 2006, there were no plans for highway widening to occur within the range of the species. Livestock grazing is being managed by the UDWR, reducing the threat of trampling of vital habitat (72 FR 3379).

Occurrence in the Project Area

Deseret milkvetch is known to occur in the Project area in Utah County. It has been identified on the east side of Thistle Creek Valley near the town of Birdseye (UDWR 2005b). Link U621 is located within 1 mile of the known Deseret milkvetch population.

Graham's Beardtongue (*Penstemon grahamii*) – FWS: Proposed Threatened; BLM: Colorado and Utah

Regulatory Status

Graham's beardtongue was initially proposed to be listed as endangered on June 16, 1976 (41 FR 24523). However, on December 10, 1979, the species was withdrawn as a candidate because the species had not been listed within 2 years (as required by a 1978 amendments to the ESA). The species was designated as a category 2 candidate for listing on December 15, 1980 (45 FR 82480). On November 28, 1983, Graham's beardtongue was elevated to a category 1 candidate for listing (48 FR 53640–53670). On

January 9, 2006, Graham's beardtongue was proposed to be listed as threatened with critical habitat designated in Uintah County, Utah, and Rio Blanco County, Colorado (71 FR 3158–3196). However, on December 19, 2006, the FWS withdrew the proposed rule to list the species as threatened as threats to the species were determined to be unlikely to threaten or endanger the species in the foreseeable future throughout all or a significant portion of its range. Withdrawal of this proposed rule to list the species also removed the species from candidate status (71 FR 76024–76035). Graham's beardtongue was proposed again for listing as a threatened species on August 6, 2013 (78 FR 47590–47611) and proposed critical habitat was established (78 FR 47532–47858).

Taxonomy and Life History

Graham's beardtongue is a member of the figwort family (*Scrophulariaceae*). The species is a perennial herb that is typically 2.8 to 7 inches in height. Each individual has one to three stems coming from a taproot (78 FR 47591).

The species flowers from late May through mid-June (UNPS 2012). Flowers emerge as a cluster of 3 to 20 flowers. Flowers vary from light to dark lavender or pinkish. Flowers produce 5 to 50 seeds from each of four stamens (78 FR 47591).

Distribution and Habitat Requirements

Graham's beardtongue is limited to the Uinta Basin within known occurrences in Carbon, Duchesne, and Uintah counties in Utah and Rio Blanco County, Colorado (UNPS 2012). The species inhabits exposed raw shale knolls and slopes. The majority of populations are associated with exposed oil shale Mahogany ledge (71 FR 3160).

Primary Threats to Survival

The 2013 proposed rule to list Graham's beardtongue and White River beardtongue as threatened identified present and potential energy exploration and development as the predominant threat to the continued existence of these species (78 FR 47590). Additional threats are invasive weeds and climate change. Livestock grazing, unauthorized collection, road maintenance and construction, wildfire, and small population size were determined not to be threats to these species at present (78 FR 47602–47605).

Occurrence in the Project Area

There are total of 62 occurrences of Graham's beardtongue within 5 miles of Links C22, C188, C196, U240, U242, and U400. Only two occurrences fall within the 1-mile buffer. One occurrence is located approximately 9 miles west of Rangely on the north side of the White River, near Link C220. The other occurrence is close to the centerline of Links C188 and U242 on Raven Ridge near the Utah-Colorado Stateline. Proposed critical habitat for Graham's beardtongue occurs approximately 1 mile from Link U242 and within 1 mile of Link U400 in Utah.

Jones' Cycladenia (*Cycladenia humilis* var. *jonesii*)—FWS: Threatened

Regulatory Status

Jones' cycladenia was proposed for listing on January 10, 1985 (50 FR 1247–1251). On May 5, 1986, the FWS listed Jones' cycladenia as a threatened species (51 FR 16526–16530).

Critical habitat has not been designated for Jones' cycladenia. FWS has not finalized or approved a comprehensive recovery plan for the species but a recovery outline was published in December 2008

(FWS 2008c). The recovery outline is intended to guide recovery efforts and inform consultation and permitting activities until a comprehensive recovery plan for the species has been finalized and approved.

Taxonomy and Life History

The genus *Cycladenia* consists of one species *Cycladenia humilis* treated as having two varieties in California (var. *humilis*, var. *venusta*) (Hickman 1993) and a third variety, Jones' cycladenia (*Cycladenia humilis* var. *jonesii*) found in Utah and Arizona. The closest taxonomic relative to Jones' cycladenia is thought to be *Mandevilla*, a neotropical genus (FWS 2008c).

Jones' cycladenia is a long-lived herbaceous perennial in the Dogbane family (*Apocynaceae*) that grows 4 to 6 inches (10 to 15 centimeters) tall. It has orbicular, wide-oval or elliptical leaves and produces pink or rose-colored, trumpet shaped flowers that resemble small morning glories from mid-April to early June (FWS 2008c).

Jones' cycladenia is rhizomatous (FWS 2008c). It overwinters as subterranean rhizomes (roots). Several to a hundred above-ground stems (or ramets) could be a single genetic individual (or genet) (FWS 2008c). Depending on the location, flowering and fruiting occurs from mid-May through June.

Little to no information about age of individual plants, years to reproductive adulthood, survivorship, mortality, or fecundity rates is available. Fruit and seed production is believed extremely limited (FWS 2008c). Its possible pollinators may have been lost or may be migratory and appear episodically (FWS 2008c). In 1992, enzyme electrophoresis research determined that clones do not extend more than 10 meters in any direction. Heterozygosity was low, which suggested inbreeding or population sub-structuring. Genetic variation was great between separated populations (FWS 2008c).

Distribution and Habitat Requirements

Jones' cycladenia occurs between 4,390 to 6,000 feet (1,338 to 1,829 meters) in plant communities of mixed desert scrub, juniper, or wild buckwheat-Mormon tea. It is found on gypsiferous, saline soils of Cutler, Summerville, and Chinle Formations (FWS 2008c). Populations are found on all aspects and on slopes that range from moderate to steep (FWS 2008d).

Primary Threats to Survival

At the time of listing, Jones' cycladenia was known from three sites with low numbers. It was thought to be a Tertiary relict, poorly adapted to the present-day arid climatic regime. Jones' cycladenia's ecosystem was thought fragile, easily degraded and slow to recover (51 FR 16526-16530). Ongoing and potential anthropogenic impacts on habitat include: OHV use; oil, gas, and mineral exploration including uranium mining and tar sands; and livestock grazing (although the rule notes the probability of grazing causing serious damage was low) (51 FR 16526-16530). Habitat disturbance was thought to be reducing seedling establishment. Jones' cycladenia was also at risk due to inadequate state and federal regulatory mechanisms (FWS 2008c).

The variety's threatened status has prompted federal land managers to implement protective measures to limit impacts from OHV and mountain bike use, cattle grazing, and extractive activities. While these threats have been managed to reduce anthropogenic impacts, these issues remain an ongoing and long-term concern. Specifically, mountain biking and OHV use occurs near the Moab and San Rafael complexes; cattle grazing occurs at sites in the San Rafael complex; and uranium mining and tar sands extraction are foreseeable threats in the both the San Rafael and Greater Circle Cliffs complex (both complexes are within Designated Special Tar Sands Areas) (FWS 2008c).

Since listing, a number of other biological limiting factors have been revealed. Preliminary research (1988 to 1993) has shown that the plant has low fruit production and seed set, likely due to a complicated pollination system and inadequate pollinator abundance (i.e., pollinators may have been lost or may be migratory and appear episodically). No seedling germination events have been documented (FWS 2008c). Genetic research at San Rafael (the Spotted Wolf Canyon site), Moab (two separate sites at Onion Creek and Castle Valley) and Greater Circle Cliffs complexes (one site at Deer Point, one site at Silver Falls Canyon, and one site at Purple Hills) indicates that these sites of Jones' cycladenia are genetically distinct and not inbred, but may face other genetic limitations, such as genetic bottlenecks or genetic drift. Several researchers have concluded that an ongoing lack of population recruitment may result in a permanent loss of genetically-important individuals or occupied sites. The species' fractured distribution could further complicate issues associated with limited natural reproduction, dispersal constraints, and genetic risks (FWS 2008c).

As a Tertiary relict, Jones' cycladenia may be affected by global climate change. It is very likely that hot extremes, heat waves, and heavy precipitation will increase in frequency (Intergovernmental Panel on Climate Change 2007). Increased temperatures could result in the need for the species to colonize cooler, higher elevation sites (FWS 2008c).

Other factors reported since the time of listing include, natural predation and relations to fragile cryptobiotic crusts in some locations (FWS 2008c).

Occurrence in the Project Area

The species has not been recorded north of Interstate 80 in Utah. Heritage data did not include any occurrences of the species within 10 miles of transmission line alternative routes (Colorado Natural Heritage Program [CNHP] 2011; UNHP 2012; WYNDD 2011). The BLM Price Field Office conducted a study in 2012 to document distribution, identify habitat requirements and model the extent of suitable habitat of the species (Sansom and Elliott 2012). The results of the study indicated that potentially suitable habitat for the species could be present along Links U727, U728, U729, U730, U732, U733 and U734 in Emery County, Utah.

Pariette Cactus (*Sclerocactus brevispinus*) – FWS: Threatened

Regulatory Status

Pariette cactus was listed as threatened under the ESA on October 11, 1979, based primarily on threats of over-collection and habitat destruction (44 FR 58868). At that time, it was listed as part of *Sclerocactus* complex of three species: Pariette cactus (*Sclerocactus brevispinus*), Colorado hookless cactus (*Sclerocactus glaucus*), and Uinta Basin hookless cactus (*Sclerocactus wetlandicus*). In 2006, a petition was filed to remove the *Sclerocactus* complex from the list of threatened plants but after a 90-day review, the petition was denied, and the status of these species remained unchanged (71 FR 75215). On September 18, 2007, the FWS initiated a 12-month petition to change the taxonomy of the threatened *Sclerocactus* complex to three distinct species to reflect the taxonomy generally accepted in scientific literature. Because all three species were once considered part of the *Sclerocactus* complex when the species was listed as threatened, all would remain listed as threatened under the new taxonomic status. In the same petition, the FWS also proposed to upgrade Pariette cactus to endangered status (72 FR 53211). On March 28, 2008, a 5-year review was released that determined that upgrading Pariette cactus from threatened to endangered was warranted, but was precluded by higher priority actions. The FWS officially recognized the taxonomic revision in September 2009 and listed each species as threatened independent of the other species (74 FR 47112–47117).

A recovery outline for Pariette cactus was published in April 2010. No critical habitat for Pariette cactus has been designated (72 FR 75215). However, the FWS and BLM are currently working to identify core conservation areas and develop management recommendations to ensure that *Sclerocactus* species can be recovered, especially in light of potential energy development projects that could increase the level of development in *Sclerocactus* habitat and across the species range. Core areas are based on pollinator travel distance and are designed to provide habitat connectivity between populations and individuals.

Taxonomy and Life History

Pariette cactus has had an involved taxonomic history. Individuals in the *Sclerocactus* complex were first collected by Schumann in 1898 and initially described as *Echinocactus glaucus*. In 1917, considering the Schumann publication to be illegitimate, Rydberg described the species as *Echinocactus subglaucus*. In 1925, Purpus treated the species as a variety of Whipple's fishhook cactus (*Echinocactus whipplei* var. *glaucus*). By 1939, the species was first placed in the genus *Sclerocactus* as *Sclerocactus franklinii* (Evans 1939). In 1966, Benson assigned six species to the *Sclerocactus* genus and noted that *S. glaucus* was distinguished from others in the genus by a large unhooked central spine and noticeably smaller seeds (Benson 1966). In 1972, Arp changed the genus to *Pediocactus*, leading to an assignment of *Pediocactus glaucus* (Arp 1972). In 1981, the species was restored to Benson's concept of *Sclerocactus* (Heil et al. 1981) and reestablished as *Sclerocactus glaucus* in the taxonomic literature (FWS 1990a).

Sclerocactus glaucus remained the accepted name until revisions to the taxonomy of the Uinta Basin hookless cactus in 1989 resulted in three distinct species, once part of the *Sclerocactus* complex. This reclassification was based on genetic studies, common garden experiments (Welsh et al. 2003), distribution, and a reevaluation of the morphological characteristics. The FWS officially recognized the taxonomic revision in September 2009 and listed each species as threatened independent of the other species (74 FR 47112–47117).

Pariette cactus is a morphologically unique *Sclerocactus*. It is much smaller (less than 3.1 inches tall) and retains the vegetative characteristics of juvenile *Sclerocactus wetlandicus* individuals in adult flowering plants (72 FR 53211). It has spheric and unbranched stems, short spines, and small pink flowers. Flowers also bloom in late April to May but the species produces green to tan fruits, sometime suffused with pink. The seeds are small, black, and convex (Flora of North America Editorial Committee 1993+).

Although no long-term demographic data is available, it is believed that the species may live for 10 to 20 years in good conditions. Populations range from 1 to more than 1,000 individuals with a wide range of ages. Known predators include the cactus borer beetle and rodents (FWS 1990a).

Distribution and Habitat Requirements

The known distribution of the *Sclerocactus* complex includes federal, state, tribal, and private lands in Utah (Uintah, Duchesne, and Carbon counties) and Colorado (Mesa, Delta, Garfield, and Montrose counties). At the time of listing, eight populations of the *Sclerocactus* complex were known to occur in five counties in western Colorado and eastern Utah. Since that time, two small outlier populations near Gateway, Colorado and Bonanza, Utah have been identified. Ninety percent of the total population of the three species occurs on BLM-managed lands (FWS 1990a). Because the specific distribution and habitat requirements vary for the three species, they are described separately.

Pariette cactus occurs only in the clay badlands of Pariette Draw in the central Uinta Basin south of Myton, Utah, which gradates into *Sclerocactus wetlandicus* near the mouth of Pariette Draw south of Ouray, Utah (FWS 1990a). The species is restricted to only one known population in an area about 10 miles long by 3 miles wide along the Duchesne-Uintah County boundary. The population is located on Bureau of Land Management, Ute Tribe, State of Utah, and private lands. The total species population is

estimated to be about 8,000 individuals on 18,000 acres. In a 1985 species inventory, 3,795 individuals were located on approximately 15,000 acres of BLM-administered land and minor amounts of state and private lands. BLM estimated that this population represented 75 percent of the total population on BLM-managed lands. Based on that information, the estimated 1985 population of Pariette cactus on BLM-managed land was approximately 5,000 individuals (72 FR 75215).

Pariette cactus grows on fine soils in clay badlands derived from the Uinta formation. It inhabits a low hilly terrain overlain with gravel and stone (UDWR 2005b). The habitat is a sparsely vegetated desert shrubland dominated by saltbush, rabbitbrush, and horsebrush. Approximately 72 percent of the range occurs within the approved Castle Pak/Eightmile Flat oil and gas the Project area and the pending Gasco Uinta Basin Natural Gas Field Development project (FWS 2008e). The remaining portion of the range contains wells drilled in the Sand Wash and Greater Boundary Units (72 FR 75215).

Primary Threats to Survival

The primary threats to the survival of the *Sclerocactus* complex stem from mineral and energy development, water development, and collection. Most of the range of the species is within existing oil and gas fields or undeveloped oil and gas lease areas. This activity has the potential to devastate local populations. The cactus is also sought out by professional and amateur cactus growers for its beautiful flowers. Because of its natural scarcity, it is a prized species for collectors and therefore could be highly threatened by the unregulated commercial trade of those plants collected from the wild (FWS 1990a). An important natural threat to *S. brevispinus* is genetic swamping from the more widespread *S. wetlandicus*, near the crossing of habitat at the mouth of the Pariette Draw (Flora of North America Editorial Committee 1993+).

Occurrence in the Project Area

The entire population of Pariette cactus is believed to be confined to a 30-square mile area around the Pariette Draw. This area lies within 5 miles of Link U402. A 2007 study located 30 occurrences of the species within 1 mile of the proposed centerline of Link U402 in the vicinity of Pariette Draw.

San Rafael Cactus (*Pediocactus despainii*) – FWS: Endangered

Regulatory Status

On December 15, 1980, the FWS published a notice of review for plants that included San Rafael cactus as a candidate for listing (45 FR 82479). Amendments to the ESA in 1982 required that a finding must be made as to whether a requested action is warranted, not warranted, or warranted but precluded by other activity within 12 months of the initial intent to list. All petitions pending as of October 12, 1982, were treated as having been received on that date. Each successive year after the 1982 amendments, the FWS released notice that an endangered determination for the San Rafael cactus was warranted but precluded by other listing activity. The final rule to list the species as endangered was published on September 16, 1987 (52 FR 34914). Critical habitat has not been designated as to prevent the escalation of illegal collection of the plant.

A draft recovery plan for the San Rafael and Winkler cactus was published in 1995. In 2007, a recovery outline for the two species was released, indicating that the final approved plan is expected in September 2009 (FWS 2007a); however, as of 2011, the final plan had not been released. Due to the species' small, restricted populations and desirability to collectors, the species is vulnerable to over-collection making it unlikely that it will be safely removed from the protection of the ESA in the foreseeable future. Thus, the object of the draft recovery plan is to downlist the species to threatened and this can be considered when: (1) a minimum of five additional separate populations with 2,000 or more individuals per population are

discovered; (2) formal land management designations and management plans that would provide long-term protection on undisturbed habitat for each population are implemented; (3) viable populations of the species are maintained by ensuring the protection of the current populations and occupied habitat for both species through enforcing the conservation provisions of Sections 7 and 9 of the ESA (FWS 1995a).

Taxonomy and Life History

San Rafael cactus is a member of the cactus family (*Cactaceae*). It was discovered by Kim Despain in 1978 and described by Welsh and Goodrich (Welsh and Goodrich 1980). It can also be known as Despain's footcactus or Despain pincushion cactus (UDWR 2005b). The genus *Pediocactus* contains eight species endemic to the Colorado Plateau region of Utah, Colorado, New Mexico, and Arizona. All eight of the species are either listed as endangered or are being considered for listing. It is believed that the seven disjunct species are relict species of a once more widespread genus that was fragmented by climate change (52 FR 34914).

San Rafael cactus is a small, ovoid, leafless, stem succulent. The cactus is distinguished from other members of the genus by its larger stem, hairless areoles, and bronze tint (52 FR 34914). There is generally only one stem that reaches 2.5 inches tall and 3.7 inches in diameter. The stem lacks a central spine, but white radial spines are common, numbering 9 to 13. The flowers grow up to 1 inch and can be yellow bronze, peach bronze, or pink with a purple midstripe. The fruit is initially green turning to reddish-brown with age. The kidney-shaped seeds are shiny and black (FWS 1995a).

Flowering occurs from April to May with fruits produced in May to June but can vary in accordance with temperature and moisture conditions. Reproduction is sexual and pollination is believed to be done by wild bees of the family *Halictidae* (FWS 1995a). The San Rafael cactus has been observed to shrink underground for several months to a year during dry or cold seasons. It is only noticeable for a short amount of time in the spring when it is in bloom. These habits make the cactus especially difficult to locate (52 FR 34914).

Distribution and Habitat Requirements

As of 1995, there are three known populations of the San Rafael cactus with an estimated total population of 20,000 individuals. Most of the plants occur on lands managed by the BLM. It is entirely restricted to the San Rafael Swell of Utah (central Emery County). One population exists in the north-central portion of the San Rafael Swell, north of the San Rafael River. The second population occurs in the south-central portion of the San Rafael Swell, south of I-70, and the third population is found in the western portion of the swell, near I-70 (FWS 1995a).

San Rafael cactus grows in fine textured, mildly alkaline soils rich in calcium derived from limestone substrates of the Carmel Formation and the Sinbad member of the Moenkopi formation. The species is most commonly found on benches, hill tops and gentle slopes with a southern exposure. It grows in open woodland of scattered Utah juniper and pinyon pine with an understory of shrubs and grasses (FWS 1995a).

Primary Threats to Survival

There are three primary threats to the survival of San Rafael cactus: over-collection, trampling, and destruction of habitat for access to oil and gas reserves. In addition, the small size of the population and limited range render the species extremely vulnerable to small disturbances. Although the San Rafael cactus can be difficult to cultivate, it is a highly prized, rare species desired in cactus collections. Cactus collectors are very active in the Colorado Plateau and, even though, it is forbidden by the National Park

Service and BLM, remoteness of the habitat of the cactus makes collection difficult to control (FWS 1995a).

San Rafael cactus habitat is vulnerable to destruction caused by off-road vehicle use and livestock. The plant itself can be shrunken into the ground during some portions of the year, which provides some natural protection from trampling. However, the species forms flower buds in the fall at ground level leaving it very vulnerable to surface disturbance and potentially reducing reproductive capacity. The spines of most cacti prevent major damage from grazing, but the size and shortness of spines on the San Rafael cactus provide very little security (FWS 1995a).

The habitat of San Rafael cactus is underlain by bentonite clay, uranium ore deposits, gypsum, petroleum, and other minerals. Future development of these resources has potential for adverse effects on the cactus and associated habitat (FWS 1995a).

Occurrence in the Project Area

San Rafael cactus is known to occur in the central portion of the Project area in Emery and Wayne counties, Utah. It has been identified from the eastern base of Cedar Mountain, southwest to The Wedge and The Red Ledges and south into Cathedral Valley (UDWR 2005b). The species is known to occur in the Project area along Links U728, U729, and U733.

Shrubby Reed-mustard (*Schoenocrambe suffrutescens*) – FWS: Endangered

Regulatory Status

On July 1, 1975, the FWS published a notice that included shrubby reed-mustard as a candidate for listing (41 FR 24523). Amendments to the ESA in 1978 required that all petitions more than 2 years old be withdrawn, but that petitions already more than 2 years old were subject to a 1-year grace period. On December 10, 1979, the FWS withdrew the petition to list the shrubby reed-mustard because it was not finalized within the 1-year grace period (44 FR 70796). The species was once again listed as a candidate species in the December 15, 1980 notice of review. Amendments to the ESA in 1982 required that a finding must be made as to whether a requested action is warranted, not warranted, or warranted but precluded by other activity within 2 years of the intent to list. All petitions pending as of October 12, 1982 were treated as having been received on that date. Each successive year after the 1982 amendments, the FWS released notice that an endangered determination for the shrubby reed-mustard was warranted but precluded by other listing activity. The final rule to list the species as endangered was published on October 6, 1987 (52 FR 37416). In September 1985, approximately 7,360 acres of critical habitat was proposed in the vicinity of Hill Creek in Uintah County (50 FR 36118–36112). No final rule has been issued finalizing designation of critical habitat for the species.

The recovery plan for three Utah reed-mustards was published in 1994. The goal of the plan is to delist or downlist the shrubby reed-mustard. Due to a small total population, vulnerability of the habitat to ongoing and potential oil and gas activity, and unrestricted off-road vehicle use, downlisting and delisting of the shrubby reed-mustard appears unlikely in the near future. However, criteria for downlisting include (1) discovering or establishing a minimum of five separate populations with 2,000 or more individuals per population and (2) document or establish formal land management designations that would provide for long-term protection on undisturbed habitat for the above five populations. The species may be considered for delisting when the above criteria are expanded to ten populations (FWS 1994a). The FWS initiated a 5-year review on October 6, 2008 (73 FR 58261). The 5-year review determined that the species should retain its current listing status (FWS 2010).

Taxonomy and Life History

Shrubby reed-mustard, also known as toad-flax cress, Graham's schoenocrambe, shrubby glaucocarpum, and the Uinta Basin waxfruit, is a member of the mustard (*Brassicaceae*) family (UDWR 2005b). It was first discovered in the Uinta Basin of Uintah County, Utah in 1935 and described by Reed C. Rollins as *Thelypodium suffrutescens*. Following further taxonomic research, in 1938 Rollins described it to the monotypic genus *Glaucocarpum*. By 1992, the name was changed to shrubby reed-mustard (*Schoenocrambe suffrutescens*) to complete a morphologically discrete phylogenetic unit of five species that also includes the threatened clay reed-mustard (*S. argillacea*) and endangered Barneby reed-mustard (*Schoenocrambe barnebyi*) (57 FR 1398). The genus is under some review and is commonly placed in either *Glaucocarpum* or *Schoenocrambe* (UDWR 2005b).

Shrubby reed-mustard is a perennial, herbaceous plant with multiple, clumped stems that reach 1 foot in height. The leaves are alternately arranged and attached to the stem by a short petiole. The flowers are light yellow or greenish yellow that grow to half an inch, displayed in a raceme of 5 to 20 flowers at the plant's leafy stems (FWS 1994a).

All three species of reed-mustards flower from April to May with fruit appearing May to June. Reproduction is sexual and pollination is aided by insects, primarily several species of bees. Within the raceme, flowers mature closest to the stem first and spread upward. The flowers are most fragrant in the morning and decline as the day progresses. Little is known about the long-term population dynamics, disease, parasitism, effect of grazing, competition, and viability of any of the species (FWS 1994a).

Distribution and Habitat Requirements

Shrubby reed-mustard is confined to localized geological formations of buff-colored calcareous shale of the Green River Formation in the Uinta Basin of eastern Utah (Duchesne and Uintah counties). In 1985, eight parcels of this habitat totaling 7,360 acres were proposed as critical habitat, but the rule was never finalized (50 FR 36118–36112). This area supports the majority of the known populations and appears to be necessary to the continued survival of the species (FWS 1994a).

There are currently seven known populations of shrubby reed-mustard. Four populations lie between Hill Creek and Willow Creek (Big Pack Mountain, Thorn Ranch, Johnson Draw, and Agency Draw) totaling approximately 2,440 individuals. Two populations are located on the west side of Hill Creek (Gray Knolls and Dog Knoll) and comprise approximately 320 individuals. A single population exists in Duchesne County approximately 15 miles from the other populations. It is located approximately 1.5 miles north of the junction of Nine Mile Creek and Daddy Canyon. This population (Badlands Cliff/Wrinkles Road) has a population of approximately 170 individuals (FWS 2010).

Shrubby reed-mustard occurs in desert-shrub communities with sparse juniper and pinyon pine trees. It grows on clay soils with white shale. In contrast to the other listed *Schoenocrambe* species, the shrubby reed-mustard generally grows on level to moderately sloping round surfaces. The soil is derived from the Evacuation Creek Member of the Green River geological formation at an elevation of 5,400 to 6,000 feet (FWS 1994a).

Primary Threats to Survival

Primary threats to shrubby reed-mustard include threats associated with the oil and gas industry, off-road vehicle use, and small population. All known populations are on federal lands that are leased for oil and gas energy reserves and petroleum deposits being developed in adjacent habitats with the exception of a small portion on Uintah and Ouray Reservation of the Ute Indian tribe. In addition, the entire range of the

species is underlain by oil shale. The species is also vulnerable to ground-disturbing activities associated with energy development (FWS 1994a).

Another particular threat to shrubby reed-mustard is association of habitat with commercially valuable native building stone composed of volcanic ash deposited during the prehistoric Uinta Lake during the Eocene epic. Previous commercial stone excavation is believed to have caused the extirpation of a portion of the population near the Big and Little Pack Mountains (50 FR 36118). In addition, there are risks associated with the species having only three small populations that could be devastated by an unpredictable catastrophe such as an extreme weather event (Beacham et al. 2005).

Occurrence in the Project Area

Shrubby reed-mustard is known to occur in the central portion of the Project area in Uintah and Duchesne counties, Utah. The Badlands Cliff/Wrinkles Road population falls within 1 mile of transmission line alternative routes.

Uinta Basin Hookless Cactus (*Sclerocactus wetlandicus*) – FWS: Threatened

Regulatory Status

Uinta Basin hookless cactus was listed as threatened under the ESA of 1973 on October 11, 1979, based primarily on threats of over-collection and habitat destruction (44 FR 58868). At that time, it was listed as part of *Sclerocactus* complex of three species: Pariette cactus (*Sclerocactus brevispinus*), Colorado hookless cactus (*Sclerocactus glaucus*), and Uinta Basin hookless cactus (*Sclerocactus wetlandicus*). In 2006, a petition was filed to remove the *Sclerocactus* complex from the list of threatened plants but after a 90-day review, the petition was denied, and the status of these species remained unchanged (71 FR 75215). On September 18, 2007, the FWS initiated a 12-month petition to change the taxonomy of the threatened *Sclerocactus* complex to three distinct species to reflect the taxonomy generally accepted in scientific literature. Because all three species were once considered part of the *Sclerocactus* complex when the species was listed as threatened, all would remain listed as threatened under the new taxonomic status. The FWS officially recognized the taxonomic revision in September 2009 and listed each species as threatened independent of the other species (74 FR 47112–47117).

A recovery outline for the *Sclerocactus* complex was published in April 2010. No critical habitat for Uinta Basin hookless cactus has been designated (72 FR 75215). However, the FWS and BLM are currently working to identify core conservation areas and develop management recommendations to ensure that *Sclerocactus* species can be recovered, especially in light of potential energy development projects that could increase the level of development in *Sclerocactus* habitat and across the species range. Core areas are based on pollinator travel distance and are designed to provide habitat connectivity between populations and individuals.

Taxonomy and Life History

Uinta Basin hookless cactus has had an involved taxonomic history. It was first collected by Schumann in 1898 and initially described as *Echinocactus glaucus*. In 1917, considering the Schumann publication to be illegitimate, Rydberg redescribed the species as *Echinocactus subglaucus*. In 1925, Purpus treated the species as a variety of Whipple's fishhook cactus *Echinocactus whipplei* var. *glaucus*. By 1939, the species was first placed in the genus *Sclerocactus* as *Sclerocactus franklinii* by Evans. In 1966, Benson assigned six species to the *Sclerocactus* genus and noted that *Sclerocactus glaucus* was distinguished from others in the genus by a large unhooked central spine and noticeably smaller seeds (Benson 1966). In 1972, Arp changed the genus to *Pediocactus*, leading to an assignment of *Pediocactus glaucus* (Arp

1972). Finally, in 1981, the species was restored to Benson's concept of *Sclerocactus* (Heil et al. 1981) and reestablished *Sclerocactus glaucus* in the taxonomic literature (FWS 1990a).

Sclerocactus glaucus remained the accepted name until revisions to the taxonomy of the Uinta Basin hookless cactus in 1989 resulted in three distinct species, once part of the *Sclerocactus* complex. This reclassification was based on genetic studies, common garden experiments (Welsh et al. 2003), distribution, and a reevaluation of the morphological characteristics. The recently published Flora of North America now recognizes *Sclerocactus glaucus*, *Sclerocactus wetlandicus*, and *Sclerocactus brevispinus*, which collectively were recognized as *Sclerocactus glaucus* at the time of listing (72 FR 53211). The FWS officially recognized the taxonomic revision in September 2009 (74 FR 47112–47117).

Uinta Basin and Colorado hookless cacti (*Sclerocactus wetlandicus* and *Sclerocactus glaucus*) are morphologically similar. They are low growing, leafless succulent plants that are oval to globular in shape. The stems are generally solitary, but sometime grow in clusters of two or three. Individuals can reach heights of 1.5 to 7 inches and 1 to 4.5 inches in diameter. Stems are covered with protuberances arising from the twelve ribs. The cacti have numerous 1- to 2-inch pinkish flowers that have pronounced ultra-violet reflectance, unique to the genus (FWS 1990a). Flowers bloom in late April to May and produce green, thin-walled fruits that turn red at maturity. The seeds are small, black, and asymmetrical. It appears that small bees (families *Halictidae* and *Anthophoridae*), ants, and gravity are the primary dispersal mechanisms that may be a limiting factor to the distribution (NatureServe 2008b).

Although no long-term demographic data is available, it is believed that the species may live for 10 to 20 years in good conditions. Populations range from 1 to more than 1,000 individuals with a wide range of ages. Known predators include the cactus borer beetle and rodents (FWS 1990a).

Distribution and Habitat Requirements

The known distribution of the *Sclerocactus* complex includes federal, state, tribal, and private lands in Utah (Uintah, Duchesne, and Carbon counties) and Colorado (Mesa, Delta, Garfield, and Montrose counties). At the time of listing, eight populations of the *Sclerocactus* complex were known to occur in five counties in western Colorado and eastern Utah. Since that time, two small outlier populations near Gateway, Colorado and Bonanza, Utah have been identified. Ninety percent of the total population of the three species occurs on BLM-managed lands (FWS 1990a). Because the specific distribution and habitat requirements vary for the three species, they are described separately.

Uinta Basin hookless cactus (*Sclerocactus wetlandicus*) is endemic to northeast Utah (Duchesne and Uintah counties) where it occurs entirely within the BLM Diamond Mountain planning area. Current population estimates are at about 30,000 individuals over a range that is approximately 60 miles long and 25 miles wide. Individuals are patchily to densely distributed near the confluence of the Green, White, and Duchesne rivers near Ouray National Wildlife Refuge and the town of Ouray, Utah south along the Green River to the vicinity of Sand Wash including concentrations near the mouth of the Pariette Draw (FWS 1990a).

Sclerocactus wetlandicus and *Sclerocactus glaucus* occur in salt desert shrub communities and pinyon-juniper woodlands on river benches, valley slopes, and rolling hills. Both species occur on Quaternary and Tertiary alluvial soils that are fine textured, dry, and overlain with cobble and pebble (BLM 2008d). The soil is weathered from the Uinta and Green River formations. Most of the range is within existing oil and gas fields or within undeveloped oil and gas lease areas. The cactus is more abundant on south facing slopes with up to a 30 percent grade at an elevation of 4500 to 5900 feet. Associated vegetation includes shadscale, galleta, black sage, and Indian rice grass (FWS 1990a).

Primary Threats to Survival

The primary threats to the survival of Uinta Basin hookless cactus stem from mineral and energy development, water development, and collection. Most of the range of the species is within existing oil and gas fields or undeveloped oil and gas lease areas (BLM 2008d). This activity has the potential to devastate local populations. The cactus is also sought out by professional and amateur cactus growers for its beautiful flowers. Because of its natural scarcity, it is a prized species for collectors and therefore could be highly threatened by the unregulated commercial trade of those plants collected from the wild (FWS 1990a).

Occurrence in the Project Area

The Uinta Basin hookless cactus is known to occur in the central portions of the Project area in Utah (Uintah, Duchesne, and Carbon counties) and Colorado (Mesa and Garfield counties). Most of the populations are located on BLM-administered lands, but also occur on the Ouray National Wildlife Refuge, the Uintah and Ouray Reservation, and private lands. In the Utah portion of the range, Uinta Basin hookless cactus occurs on alluvial river terraces near the confluence of the Green, White, and Duchesne rivers south along the Green River to the vicinity of Sand Wash and the mouth of the Pariette Draw, the Badland Cliffs, and the clay badlands of the Pariette Draw drainage south of Myton, Utah (FWS 1990a). Populations are known to occur along Links U400 and U402 along Pariette Draw, Nine Mile Canyon, and the Green River.

Ute Ladies'-tresses (*Spiranthes diluvialis*) – FWS: Threatened

Regulatory Status

On September 27, 1985, the FWS published a notice that included Ute ladies'-tresses as a Category 2 species candidate for listing (50 FR 39526). Category 2 comprised taxa for which the FWS had information indicating the appropriateness of a proposal to list as endangered or threatened but for which more substantial data was needed on biological vulnerability and threats. After a review of status information acquired after the 1985 notice, the FWS upgraded Ute ladies'-tresses to a Category 1 species in the February 21, 1990, Notice of Review (55 FR 6184), which meant the FWS had in possession enough data to support listing. The final decision to list the species as threatened was published on January 17, 1992 (57 FR 2048). Critical habitat was not designated for the species. On May 10, 1996, the FWS received a petition from the Central Utah Water Conservancy District to delist Ute ladies'-tresses. Due to the low priority assigned to delisting petitions, the FWS postponed immediate action. On October 12, 2004, the FWS initiated a 5-year review that would be used to determine the outcome of the petition to delist (69 FR 60605). The recovery plan for Ute ladies'-tresses was published in 1995 (FWS 1995b).

The recovery plan for Ute ladies'-tresses was published in 1995 (FWS 1995b). The objective of the plan is the continued existence of Ute ladies'-tresses, but no specific delisting criteria are given. The species will be considered for delisting when sites that include occupied habitat harboring 90 percent of the plants in each ecoregion are protected at public ownership or higher levels of protection and managed in accordance with a FWS-approved management plan. The plan must assure implementation of management practices that provide the range and spatial distribution of successional and hydrologic regimes required to maintain the species and its pollinators in self-sustaining, naturally occurring populations that will remain in effect after delisting occurs.

Taxonomy and Life History

The Ute ladies'-tresses, also known as flood ladies'-tresses, is a member of the family *Orchidaceae* (UDWR 2005b). Prior to 1984, only three species of white-flowered Ladies'-tresses were known to exist – *Spiranthes cernua*, *Spiranthes romanzoffiana*, and *Spiranthes porrifolia*. In 1980, a specimen was

collected near Golden, Colorado that was first thought to be *Spiranthes cernua* and sent to Dr. Charles Sheviak who was conducting studies on the genus *Spiranthes*. In 1984, after visiting sites in both Colorado and Utah, Sheviak described the new species *Spiranthes diluvialis*. In the description, *Spiranthes diluvialis* is believed to have resulted from the hybridization of *Spiranthes magnicamporum* and *Spiranthes romanzoffiana* during a Pleistocene pluvial period, at a time when the two species would have occurred sympatrically (FWS 1995b).

Ute ladies'-tresses is a long-lived perennial orchid with a flowering stalk arising from clusters of basal leaves and short thickened roots. It reproduces only by seeds and can produce as many as 7300 seeds per fruit that can persist for up to 8 years as subterranean saprophytes dependent on mycorrhizal fungi. Leaf rosettes may emerge at the end of the growing season and overwinter. In any given year, mature plants can be found in stages – flowering, non-flowering (vegetative), and seasonally dormant stages. Under adverse conditions, individual plants may not flower and can persist underground for an unknown period of time until conditions are amenable to survival above ground. This can make locating the plant difficult and the species can only reliably be identified when flowering (FWS 1995b).

Distribution and Habitat Requirements

Ute ladies'-tresses is known to occur in three general areas: near the base of the eastern slope of the Rocky Mountains, the Uinta Basin, and near the western base of the Wasatch Mountains. Near the Rocky Mountains, the species is found in north-central and central Colorado (Clear Creek, Jefferson, Boulder, Larimer, and possibly Moffat counties), east-central Idaho (Bonneville and Jefferson counties), southwestern Montana (Beaverhead, Broadwater, Gallatin, Jefferson, and Madison counties) and east-central and southeastern corner of Wyoming (Converse, Goshen, Laramie, and Niobrara counties), and downstream in western Nebraska (Sioux, Washington, and Okanogan counties). In the Uinta Basin, the species is generally associated with the upper Colorado River drainage. Near the Wasatch Mountains, the species is generally found in the eastern Great Basin of western Utah in Daggett, Garfield, Wayne, Utah, Salt Lake, Weber, and Tooele counties (FWS 1995b).

The Ute ladies'-tresses is endemic to moist or very wet meadows near springs, lakes, or perennial streams. It is also found in abandoned stream meanders that retain ample groundwater. It is found at elevations ranging from 4,300 to 7,000 feet. The species is generally found in areas with relatively open vegetation, although some individuals have been observed in the riparian woodlands of eastern Utah and Colorado. Populations are generally small and located in scattered groups occupying small areas within the riparian system (FWS 1995b).

Primary Threats to Survival

Riparian habitat and the nomadic grazing typical of native ungulates are vital to Ute ladies'-tresses to create and maintain habitat, both of which have been altered since settlement of the west. Orchid habitat is now grazed by cows, sheep, or horses, all of whose grazing habits differ from native ungulates in timing and intensity. Season-long grazing where the plants are destroyed after flower stem formation can be detrimental to the already low reproductive success of the species. Water developments, urbanization, and dams interrupt flooding cycles causing fragmentation and destruction of vital habitat (57 FR 2048). Reservoirs, dams, and diversions have drastically altered some stream systems by completely dewatering some reaches and changing their magnitude and timing of flow. In addition, invasion by noxious weeds such as the leafy spurge (*Euphorbia esula*), spotted knapweed (*Centaurea maculosa*), and Russian knapweed (*Centaurea repens*) can outcompete the species in already limited habitat (FWS 1995b). Degradation of habitat for pollinator species in the surrounding area has also been proposed as a threat to the species (Sipes and Tepedino 1995).

Occurrence in the Project Area

Ute ladies'-tresses is known to occur along Links U420 and U430. One location is near the junction of Benson Draw and the Duchesne River along Link U420. Another location is along the Lake Fork Canal west of Upalca along Link U420. Another location is along Currant Creek west of Fruitland along Link U420. Two occurrences are located along the Lake Fork River west of Ioka along Link U430. A known population is crossed by the centerline of Link U430 at Lake Fork River.

At the request of the BLM and FWS, EPG identified potentially suitable habitat for Ute ladies'-tresses within 6th level hydrologic unit code (subwatersheds) crossed by Project alternative routes using GIS desktop analysis. Modeled potentially suitable habitat was visually refined for an area within a 1-mile buffer around all reference centerlines as defined in April 2012, October 2012, and again in April 2013 based upon revised centerlines in Wyoming, Colorado and Utah.

Western Prairie Fringed Orchid (*Platanthera praeclara*) – FWS: Threatened

Regulatory Status

On October 11, 1988, the FWS published a proposal to list western prairie fringed orchid as threatened (53 FR 39621-39626). This rule was finalized on September 28, 1989 (54 FR 39857-39863). Critical habitat has not been designated for the species.

The recovery plan for western prairie fringed orchid was published in 1996 (FWS 1996). The objective of the plan is to delist the species. The species will be considered for delisting when sites that include occupied habitat harboring 90 percent of the plants in each ecoregion are protected at public ownership or higher levels of protection and managed in accordance with a FWS-approved management plan. The plan must assure implementation of management practices that provide the range and spatial distribution of successional and hydrologic regimes required to maintain the species and its pollinators in self-sustaining, naturally occurring populations that will remain in effect after delisting occurs.

Taxonomy and Life History

The western prairie fringed orchid, also known as Great Plains white fringed orchid, is a member of the family *Orchidaceae*. The species was previously included as a single species with the eastern prairie fringed orchid (*Platanthera leucophaea*) but was described separately in 1986 by Dr. Bowles on the Sheyenne National Grassland in Ransom County, North Dakota (FWS 1996).

The western prairie fringed orchid is a smooth, erect perennial herb with two to five fairly thick elongated hairless leaves. Flowers are wide and white in color with the lower petal deeply three-lobed and fringed. Plants typically grow to approximately 4 feet in height (FWS 1996). Like many orchids, western prairie fringed orchid may experience periods of dormancy. Research estimates 4 to 12 percent of plants may be dormant each year and dormancy may be as short as 1 year but could last as long as 8 years (FWS 2009a). This can inhibit the ability of surveyors to detect the species presence.

Distribution and Habitat Requirements

The species is historically known to occur throughout the Great Plains of North America. In 1996, populations of western prairie fringed orchid were known to occur in 41 counties across six states (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota) and Manitoba, Canada (FWS 1996). Populations in Nebraska are located within the Platte River watershed.

The species inhabits tallgrass prairies and is found most often on unplowed, calcareous prairies and sedge meadows. It has also been known to occur at disturbed sites in successional communities such as borrow pits, old fields, and roadside ditches. Most locations are similar in that they are subirrigated by near-surface groundwater that provides a reliable source of water. Species likely to occur with the orchid are big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), and Indiangrass (*Sorghastrum nutans*) in tallgrass prairies and sedge and spikerush (*Eleocharis* spp.) species in sedge meadows (FWS 1996).

Primary Threats to Survival

Historically, the major cause for decline of the species was conversion of habitat to cropland. Hydrologic changes that draw down or contaminate the water table may also adversely affect the species. Additional practices may also affect the species depending on their timing, frequency, and intensity. These include burning, grazing, and mowing (FWS 1996). However, the species is dependent on periodic disturbance, but these management practices must be carefully implemented (FWS 2009a).

In addition to these threats, non-native species may out-compete western prairie fringed orchid. Inter-seeding of non-native species to increase livestock forage is promoted in some states inhabited by western prairie fringed orchid, such as Nebraska (FWS 2009a).

Occurrence in the Project Area

The western prairie fringed orchid is not known to occur in the Project area. However, populations in Nebraska occur in the Platte River watershed. Therefore, the populations may be affected should the project draw water from the Platte River.

White River Beardtongue (*Penstemon scariosus* var. *albifluvis*) – FWS: Proposed Threatened; BLM: Colorado, Utah

Regulatory Status

White River beardtongue was first recognized as a candidate species on November 28, 1983 (48 FR 53640) but immediate issuance of a proposed rule and timely promulgation of a final rule for the species was precluded by higher priority listing actions. The species received a listing priority number of 9 due to ongoing and imminent threats of a moderate magnitude for the subspecies population in a species assessment published in October 2011 (76 FR 66370–66439). White River beardtongue was proposed for listing as a Threatened species on August 6, 2013 (78 FR 47590–47611) and proposed critical habitat was established (78 FR 47532–47858).

Taxonomy and Life History

White River beardtongue is a member of the figwort family (UDWR 2005b). It was first described as a unique species, *Penstemon albifluvis* in 1982 by J.L. England. However, in 1984 Arthur Cronquist and others redefined it as a variety of Garrett's penstemon (*Penstemon scariosus*), and changed the name to *Penstemon scariosus* var. *albifluvis*. *Penstemon scariosus* var. *albifluvis* differs from a typical *Penstemon scariosus* by exhibiting a shorter corolla and anther hairs and has a reduced basal leaf rosette. In addition, *Penstemon scariosus* var. *albifluvis* occurs at lower elevation oil shale barrens near the White River along the Utah-Colorado state-line (FWS 2007b).

White River beardtongue is an herbaceous perennial, about 6 to 20 inches tall. It has multiple clusters of upright stems with opposite leaves that are linear to linear-lanceolate. The flowers bloom in late May to June, when the woody caudex reaches more than 4 centimeters. The flowers are light blue to lavender in

color with seeds produced by late June. Due to the presence of the woody caudex, the plant is believed to be long-lived (FWS 2007b).

Distribution and Habitat Requirements

Known populations of White River beardtongue are limited to a 20-mile arc that extends from Raven Ridge west of Rangely in Rio Blanco County, Colorado, to the vicinity of Willow Creek in Uintah County, Utah (78 FR 47595)

White River beardtongue is endemic to the oil shale barrens found in semi-barren openings in Pinyon-juniper-desert shrub or desert shrub communities on substrates composed of fine textured soils and shale fragments weathered from the Green River Formation of the Uinta Basin of northeastern Utah and adjacent Colorado. This geologic formation covers more than 100 square miles of area in Utah and Colorado; however, the species currently occupies less than 1 percent of the extent of oil shale barrens available in Colorado and Utah. It is frequently found on white or red soil at an elevation of 5,000 to 6,680 feet. Associated vegetation includes shadscale, rabbitbrush, Indian ricegrass, saline wildrye, sagebrush, and Barneby's thistle (*Cirsium barnebyi*) (FWS 2007b).

Primary Threats to Survival

The 2013 proposed rule to list Graham's beardtongue and White River beardtongue as Threatened identified present and potential energy exploration and development as the predominant threat to the continued existence of these species (78 FR 47590). Additional threats are invasive weeds and climate change. Livestock grazing, unauthorized collection, road maintenance and construction, wildfire, and small population size were determined not to be threats to these species at present (78 FR 47602-47605).

Occurrence in the Project Area

White River beardtongue is located in Uintah County, Utah, and western Rio Blanco County, Colorado, near the White River to the vicinity of Evacuation Creek and in the vicinity of Willow Creek (FWS 2011g). Populations located along the White River near the Utah-Colorado border are located near Links U240 and C220. Nearest proposed critical habitat for White River beardtongue is approximately 5 miles from Link U242 in Utah.

E.6.1.2 Bureau of Land Management, U.S. Forest Service, and State-Sensitive Plant Species

Argyle Canyon Phacelia (*Phacelia argylensis*) – BLM: Utah

Argyle Canyon phacelia is found only in Argyle Canyon on the West Tavaputs Plateau in Uintah County, Utah (Welsh et al. 2008). It grows on sandy-silty soil in wash bottoms on the Green River Shale Formation in pinyon-juniper serviceberry, and Douglas fir communities at 7,595 feet (Welsh et al. 2008). Occurrences of the species are located within 5 miles of transmission line alternative routes in the BLM Vernal Field Office.

Barneby's Cat's-eye (*Cryptantha barnabyi*) – BLM: Utah

Barneby's cat's-eye is a perennial forb that is locally abundant on the domed or gently sloping white shale knolls of the Green River Formation in the Uinta Basin, mostly in shadscale and pinyon-juniper communities from 6,070 to 7,870 feet (NatureServe 2013). Occurrences of the species are located within 1 mile of transmission line alternative routes in the BLM Vernal Field Office.

Beaver Rim Phlox (*Phlox pungens*) – BLM: Wyoming

Beaver Rim phlox is a perennial forb endemic to the Wind River and Green River basins and the southeastern foothills of the Wind River Range. The species grows on sparsely vegetated clay and shale slopes in the Green River Basin at elevations from 6,000 to 7,400 feet (NatureServe 2013). WYNDD-modeled habitat for the species occurs in the Project area in Wyoming (WYNDD 2011).

Bolander's Camissonia (*Camissonia bolanderi*) – BLM: Utah

Bolander's camissonia was first located and described as a species in 2005. It is known only from a single location in the upper Tidwell Draw approximately 15 miles northwest of the town of Green River. This location is on the Triassic Moenkopi Formation in association with saltbush and ephedra at 4,780 feet in elevation (Atwood and Welsh 2007). This sole occurrence is located along Link U730.

Caespitose Cat's-eye (*Cryptantha caespitosa*) – BLM: Colorado

Caespitose cat's-eye occurs on sparsely vegetated shale knolls at 6,200 to 8,100 feet. Habitat includes pinyon-juniper or sagebrush and is typically found with other cushion plants (CNHP 1997). Current known locations are in Daggett, Uintah, Duchesne, and Carbon counties of Utah and Moffat County, Colorado (UDWR 1998). There is one known occurrence of the species within 0.5 mile of centerline of Link U401 near the Bad Land Cliffs in Duchesne County. Two occurrences are located between 1.0 and 1.5 miles of the centerline for Link U20 in Daggett County. Three known occurrences are located in Rio Blanco and Moffat counties are located along transmission line alternative routes for Links C61 and C220.

Canyon Sweet-vetch (*Hedysarum occidentale* var. *canone*) – USFS: Manti-La Sal National Forest

Canyon sweet-vetch is endemic to Carbon, Duchesne, and Emery counties, Utah, and occurs on or below the coal measures of the Mesa Verde group (Welsh et al. 2008). It is found in pinyon-juniper, serviceberry (*Amelanchier* spp.), maple (*Acer* spp.), alderleaf mountain mahogany, and sagebrush communities between 6,400 and 8,300 feet (UNPS 2012). The species is known to occur along several Links in Carbon and Emery counties in Utah.

Carrington Daisy (*Erigeron carringtoniae*) – USFS: Manti-La Sal National Forest

Carrington daisy is endemic to Emery, Sanpete, and Sevier counties, Utah. It is found on Flagstaff Limestone in meadows and escarpment margins between 10,000 and 11,000 feet in elevation (UNPS 2012). The species is known from two occurrences within the Project area along Link U630. Both occurrences are located within 2.5 miles of Trail Mountain in the Manti-La Sal National Forest.

Cedar Rim Thistle (*Cirsium aridum*) – BLM: Wyoming

Cedar Rim thistle occurs on barren slopes, fans, and draws on whitish-gray sandstone, chalk, tufaceous colluviums, or clay substrates in bunchgrass or cushion plant communities in openings within Wyoming big sagebrush grasslands. The species is endemic to central Wyoming (Fertig and Thurston 2003). There are no known occurrences within the vicinity of the Project area; however, there is predicted suitable habitat that occurs in the Project area. Specifically, there is suitable habitat within the 1-mile buffer along Link W21 and W491. There is high and medium likelihood suitable habitat along the centerlines of Links W126, W127, and W128 southwest of Wamsutter.

Creutzfeldt's Cat's-eye (*Cryptantha creutzfeldtii*) – BLM: Utah; USFS: Manti-La Sal National Forest

Creutzfeldt's cat's-eye occurs in scattered pinyon-juniper communities with an understory of black sagebrush and mat *Atriplex* communities on a silty-clay substrate of the Mancos Shale Formation overlain with Emery Sandstone at elevations from 5,250 to 6,500 feet. It is endemic to central Utah (Carbon, Emery, and Sevier counties) (UNPS 2012). It is currently known from scattered locations along the base of the Book Cliffs and Wasatch Plateau escarpments as they flank Castle Valley on the north and west edges (Franklin 2005) including the Manti-La Sal National Forest, BLM, and privately-owned lands (UNPS 2012). A study in 1997 reported six occurrences at Rowley Flat near the junction of Link U590, U630, and U765 west of Huntington, Utah. All six occurrences are located within 0.6 mile of the centerlines with three occurrences being crossed by the centerlines.

Debris Milkvetch (*Astragalus detritalis*) – BLM: Colorado, Utah

Debris milkvetch occurs on rocky soils ranging from sandy clays to sandy loams on alluvial terraces with cobbles at 5,400 to 7,200 feet. Habitat includes pinyon-juniper and mixed desert shrub communities (CNHP 1999). The species is endemic to the Uinta Basin where it is locally common across the Tavaputs Plateau; also known to occur near Starvation Reservoir to the White River drainage and Vermillion Bluffs in Colorado. Known occurrences are located along centerlines of numerous links in Duchesne and Uintah counties, Utah, and Rio Blanco County, Colorado.

Dense Twinpod (*Physaria condensata*) – BLM: Wyoming

Dense twinpod is a perennial forb endemic to the southern Overthrust Belt and lower Green River Basin in southwest Wyoming. It grows on sparsely vegetated shaley slopes and ridges from 6,500 to 7,000 feet (NatureServe 2013). WYNDD-modeled habitat for the species occurs in the Project area in Wyoming (WYNDD 2011).

Dolores River Skeletonplant (*Lygodesmia grandiflora* var. *doloresensis*) – BLM: Colorado, Utah

Dolores River skeletonplant grows between canyon walls on reddish purple alluvial and colluvial soils of the Cutler Formation at 4,000 to 5,500 feet (CNHP 2002). It occurs in juniper, sagebrush, rabbitbrush, and blackbrush communities (UNPS 2012). It has the most restricted distribution of any plant in the genus and is found only in Grand County, Utah, and Mesa County, Colorado. No known occurrences are located in the Project area. The closest known occurrence is located in very northwestern Mesa County, Colorado, between Prairie Canyon and the Colorado-Utah border. This occurrence is approximately 2 miles west of Link C196.

Duchesne Milkvetch (*Astragalus duchesnensis*) – BLM: Colorado

Duchesne milkvetch occurs on sandstone or shale outcrops at 4,600 to 6,400 feet in pinyon-juniper woodland and desert shrub communities. Current known distribution includes Utah (Uintah and Duchesne counties) and Colorado (Moffat and Rio Blanco counties) (CNHP 1997). Known occurrences are located in the Project area along links in Duchesne, Uintah, and Daggett counties in Utah and a single occurrence along Link C195 in Rio Blanco County, Colorado, near Rabbit Mountain.

Ephedra Buckwheat (*Eriogonum ephredoides*) – BLM: Colorado

Ephedra buckwheat grows on white shales and soils derived from the Green River Formation. The habitat is sparsely vegetated white shale slopes at 5,600 to 6,030 feet (CNHP 2002). The current known distribution is limited to Colorado (Rio Blanco County) and Utah (Uintah County). There are four known

occurrences within 4 miles of the transmission line alternative routes in Utah (Links U240 and U400). Only one of these occurrences is less than 30 years old. It is located in southeastern Duchesne County, Utah, near Twin Knolls approximately 3 miles south of Link U400. There is one occurrence within the 1-mile buffer in Colorado near Shavetail Park along Link C220.

Ferron's Milkvetch (*Astragalus musiniensis*) – BLM: Colorado

Ferron's milkvetch occurs on shale and sandstone or the alluvium derived from them at 4,700 to 7,000 feet. Habitat includes gullied bluffs, knolls, benches, and open hillsides in pinyon-juniper woodlands or desert shrub communities. Current known distribution includes Utah and Colorado (Garfield and Mesa counties) (CNHP 1997). Known occurrences of Ferron's milkvetch are located along transmission line alternative routes in Carbon, Emery, and Grand counties in Utah and at a single occurrence in Rio Blanco County, Colorado. Numerous additional occurrences are located within 5 miles of transmission line alternative routes in those counties named above as well as Mesa County, Colorado.

Gibben's Beardtongue (*Penstemon gibbensii*) – BLM: Wyoming, Colorado

Gibben's beardtongue is known to occur in Utah, Wyoming, and Colorado, but in relatively close proximity to the junction of these three states. The species inhabits shaley slopes and bluffs along the Green River at elevations of 5,500 to 7,700 feet. Studies in Wyoming of soils have revealed that a common component of all sites in Wyoming have volcanic ash associated with the shale/chalk substrate. In the Project area there are three highly studied populations encompassing several hundred plants each in Sweetwater and Carbon counties, Wyoming. Two populations are located along Link W301 and the remaining population is along Link W410. In Daggett County, Utah, another large population estimated in 1989 at more than 700 plants, but only a single individual was detected in 2010 (UNHP 2012). This population is located along the Green River approximately 3 miles east of Link U20. Predicted suitable habitat is located within the 1-mile buffer of Links W110, W111, W113, W300, W301, W302, W321, W370, W410, and W411. All links except W111 and W370 have habitat along the centerlines.

Goodrich's Blazingstar (*Mentzelia goodrichii*) – BLM: Utah; USFS: Ashley National Forest

Goodrich's blazingstar grows on steep, white, marly, calciferous shale outcrops of the Green River Formation at 8,100 to 8,800 feet. Associated vegetation includes limber pine, pinyon pine, Douglas fir, mountain mahogany, and rabbitbrush. It is endemic to southern Duchesne County where it is known to occur along the Bad Land Cliffs above Argyle Canyon and west into Avintaquin Canyon (Franklin 2005) and along the escarpment of Willow Canyon and the Anthro Mountain area of the West Tavaputs Plateau (UDWR 1998). There are three known occurrences located along the centerlines of Links U401 and U431.

Goodrich's Columbine (*Aquilegia scopulorum* var. *goodrichii*) – BLM: Utah

Goodrich's columbine is endemic to Duchesne County, Utah, and occurs in bristlecone pine, limber pine, Salina wildrye, mountain mahogany, pinyon, and Douglas fir communities in Green River Shale bluffs and ridge crests from 7,400 to 9,400 feet (Welsh et al. 2008). Occurrences of the species are located within 1 mile of transmission line alternative routes in the BLM Vernal Field Office.

Graham's Cat's-eye (*Cryptantha grahamii*) – BLM: Utah

Graham's catseye is a long-lived perennial that grows in mixed desert shrub, sagebrush, pinyon-juniper, and mountain brush communities on Green River Shale at 5,000 to 7,400 feet elevation within the Uinta Basin in Duchesne and Uintah counties (UNPS 2012) and San Juan County (NatureServe 2013) in Utah.

Occurrences of the species are located within 5 miles of transmission line alternative routes in the BLM Vernal Field Office.

Grand Junction Suncup (*Camissonia eastwoodiae*) – BLM: Colorado

Grand Junction suncup inhabits mat-saltbush, shadscale, blackbrush, and juniper communities at elevations of 3,900 to 5,900 feet. The species is only known from Delta and Mesa counties, Colorado and Grand County in Utah (NatureServe 2011). There are three known occurrences within 2.5 miles of the centerline of Link C270 west of Mack, Colorado. One of these occurrences is along the centerline at the Colorado-Utah border.

Green River Greenthread (*Thelesperma caespitosum*) – BLM: Wyoming, Utah

Green River greenthread occurs on white shale slopes and ridges of the Green River Formation at approximately 5,900 feet. It is endemic to Duchesne and Uintah counties in Utah and Sweetwater County, Wyoming where the current known distribution includes Ashley National Forest, BLM, state, and private lands (UNPS 2012). Two known occurrences of Green River Greenthread are located within 0.5 mile of Link U401 near Antelope Canyon in Duchesne County. Two occurrences from BLM Vernal Field Office are located along the centerline in this same area. Three additional occurrences are located within 3 miles of transmission line alternative routes in the same Bad Land Cliffs area of Duchesne County.

Hairy Townsend-daisy (*Townsendia strigosa* var. *prolixa*) – BLM: Utah

Hairy Townsend-daisy is an unrecognized variety of *T. strigosa* that was first collected at Chepeta Wells in the Uinta Basin (Welsh et al. 2008). The species inhabits salt desert shrub, mixed desert shrub, and pinyon-juniper communities between 4,790 and 6,220 feet (Welsh et al. 2008). Occurrences of the species are located within 5 miles of reference centerlines in the Uinta Basin in the BLM Vernal Field Office.

Hamilton's Milkvetch (*Astragalus hamiltonii*) – BLM: Utah

Hamilton's milkvetch is endemic to the Uinta Basin in Uintah County, Utah. The species inhabits pinyon-juniper and desert shrub communities in the Duchesne River, Wasatch, Mowry Shale, Dakota, and other formations between 5,250 and 6,200 feet (UNPS 2012). BLM-mapped potential habitat for the species is crossed by Links U410, U391, and U390.

Horseshoe Milkvetch (*Astragalus equisolensis*) – BLM: Colorado, Utah

Horseshoe milkvetch is only known from Uintah County, Utah, and Mesa County, Colorado. The species inhabits sagebrush, shadscale, horsebrush, and other mixed desert shrub communities on the Duchesne River Formation at elevations of 4,800 to 5,200 feet (UNPS 2012). There is a large population that is crossed by the centerline of Link U321 and is within the 1-mile buffer of Link U380. The population is located in the area of Horseshoe Bend along the Green River southwest of Jensen. It extends into the area within a triangle formed by Links U321, U322, U380, and U390. BLM-mapped potential habitat for the species is crossed by Links U390 and U310.

Huber's Pepperwort (*Lepidium huberi*) – BLM: Utah

Huber's pepperwort is a subshrub endemic to eastern Utah and western Colorado in the Uinta Mountains and on the East Tavaputs Plateau (NatureServe 2013b). It grows in blackbrush, mountain brush, ponderosa pine, and spruce-fir communities, in sand or silty sands derived from the Shinarump Member of the Chinle, Moenkopi, Park City, and Weber Sandstone formations (NatureServe 2013; UNPS 2012; Welsh et al. 2008). Occurrences of the species are located within 5 miles of transmission line alternative routes in the Uinta Basin in the BLM Vernal Field Office.

Jones' Bluestar (*Amsonia jonesii*) – BLM: Colorado

Jones' bluestar occurs on clay, sandy, gravelly soils of dry open areas. The habitat is typically desert-steppe, rock gorges, or canyons at 4,500 to 5,000 feet (CNHP 2002; Spackman and Anderson 2002). A single occurrence in Colorado is located within 1 mile of the centerline of Link C270 northwest of Mack, Colorado. The closest known occurrence in Utah is located within 1.5 miles of Link U90 north of Jensen. There are no known occurrences on Jones' bluestar within 3 miles of any transmission line alternative routes more recent than 1965.

Laramie False Sagebrush (*Sphaeromeria simplex*) – BLM: Wyoming

Laramie false sagebrush occurs on gentle slopes or rims of dry, rocky limestone-sandstone plains in openings dominated by cushion plant communities within areas of more densely vegetated juniper, limber pine, big sagebrush, or mountain mahogany at elevations of 7,200 to 8,760 feet. The species is endemic to southeast Wyoming in the western foothills of the Laramie Range, Shirley Basin, and Shirley Mountains (Fertig and Thurston 2003). There are no known occurrences of the species in the Project area; however, there is modeled suitable habitat in the Project area. There is one area of medium likelihood suitable habitat within the 1-mile buffer of Link W370 northeast of Baggs, Wyoming. Other areas of suitable habitat are located within 5 miles of the centerlines of Links W15, W21, and W30.

Large-fruited Bladderpod (*Lesquerella macrocarpa*) – BLM: Wyoming

Large-fruited bladderpod is a perennial forb endemic to a small area in the western rim of the Great Divide Basin and the Green River Basin. The species grows on barren or sparsely vegetated gypsum-clay hills and benches and clay flats from 7,200 to 7,700 feet (NatureServe 2013). WYNDD-modeled habitat for the species occurs in the Project area in Wyoming (WYNDD 2011).

Ligulate Feverfew (*Parthenium ligulatum*) – BLM: Colorado

Ligulate feverfew occurs on barren shale knolls at 5,400 to 6,500 feet in elevation in Utah and Colorado (Rio Blanco and Moffat counties) (CNHP 1997). Within the vicinity of the Project area, the ligulate feverfew is known to occur in Rio Blanco County, Colorado. Only one known occurrence is located in the Project area. It is along the centerline of Link C220 where this link crosses the White River. Two other occurrences are located on the western edge of Raven Ridge approximately 2.5 miles southeast of Link U242.

Meadow Pussytoes (*Antennaria arcuata*) – BLM: Wyoming

Meadow pussytoes is a perennial forb endemic to the Great Basin in south-central Idaho, northeastern Nevada, and central and southwestern Wyoming. The species occurs on the edges and hummocks of moist meadows surrounded by sagebrush grassland communities from 4,900 to 7,900 feet (NatureServe 2013). WYNDD-modeled habitat for the species occurs in the Project area in Wyoming (WYNDD 2011). The species is also a USFS sensitive species, though it does not occur on national forests within the Project area.

Narrowleaf Evening Primrose (*Oenothera acutissima*) – BLM: Colorado

Narrowleaf evening primrose grows in sandy, gravelly, and rock soils along drainage bottoms and in seasonally wet areas (CNHP 1997) associated with lodgepole pine, ponderosa pine, and Rocky Mountain juniper-mountain sagebrush communities (UDWR 1998). It is endemic to Utah (Uintah, Duchesne, and Daggett counties) and Colorado (Moffat County). In Utah, the species is located within and nearby Link U30. Data from BLM Vernal Field Office shows one known occurrence along the centerline of Link U30.

The transmission line alternative routes are located outside the known range of the Flaming Gorge evening primrose in Colorado.

Narrow-stem Gillia (*Gilia stenothyrsa*) – BLM: Colorado

Narrow-stem gilia occurs on silty to gravelly loam soils derived from the Green River or Uinta Formations in grassland, sagebrush, mountain mahogany, or pinyon-juniper communities between 5,000 and 6,000 feet (CNHP 1997). Current known distribution is Mesa and Rio Blanco counties in Colorado (CNHP 1997) and in Uintah, Duchesne, Carbon, and Emery counties in Utah (NRCS 2013c). Occupied habitat and occurrences of the species are located within a mile of Links C186 and C196 in the BLM White River Field Office in Colorado.

Ownbey's Thistle (*Cirsium ownbeyi*) – BLM: Wyoming

Ownbey's thistle primarily occurs on rocky, gravelly, sandy soils in alcoves and side canyons at cliff bases, bedrock seeps, or riparian areas at elevations from 5,100 to 7,280 feet (UDWR 1998). Habitat includes sagebrush, juniper, and riparian communities (UNPS 2012). Current known distribution is Daggett and Uintah counties, Utah and Moffat County, Colorado; however, the species is not listed as sensitive by the BLM Colorado or Utah. A single occurrence is known from in the Project area near Massadona, Colorado at the junction of Links C175, C177, and C186. Three occurrences are located between 1 and 1.5 miles of the centerline of Link U20 near Swallow Canyon along the Green River in Daggett County.

Persistent-sepal Yellowcress (*Rorippa calycina*) – BLM: Wyoming

Persistent-sepal yellowcress occurs on sandy soils near the high water lane of riverbanks and shorelines at 4,300 to 6,800 feet. Current known distribution includes Carbon and Sweetwater counties in Wyoming (Fertig et al. 1994). A single known occurrence is located in the Project area along Link W30 southwest of Sinclair, Wyoming. Predicted suitable habitat is located within the 1-mile buffer of many links within Wyoming. Low likelihood suitable habitat is present along the centerlines of Links W22, W26, W101, W102, W108, W125, W126, W128, W129, W490, and W491. High likelihood suitable habitat is present on the reference centerline of Link W30.

Piceance Bladderpod (*Lesquerella parviflora*) – BLM: Colorado

Piceance bladderpod occurs on shale outcrops of Green River Formation on ledges and slopes of canyons in open areas at 6,200 to 8,600 feet. It is a Colorado endemic that occurs in the Piceance Basin in Garfield, Rio Blanco, and Mesa counties (CNHP 1997). Only one known occurrence is located in the Project area. It is located in Hay Gulch along Link C104 approximately 10 miles west of Meeker. No other known occurrences are located within 10 miles of alternative routes.

Psoralea Globemallow (*Sphaeralcea psoraloides*) – BLM: Utah

Psoralea globemallow occurs on the Tununk Member of the Mancos Shale, Buckhorn Conglomerate, Curtis Sandstone, Entrada Siltstone, Carmel, and Kaibab Limestone from 4,000 to 6,300 feet. Typical habitat is saline, gypsiferous soils in Zuckia-Ephedra, shadscale, eriogonum, lepidum, and pinyon-juniper communities (UNPS 2011, 2012). It is endemic to the San Rafael Swell of the Colorado Plateau on BLM and state lands (UDWR 1998). A single occurrence is known to occur in the Project area. This occurrence is located approximately 0.7 mile from Link U730 west of the town of Green River.

Racemose Milkvetch (*Astragalus racemosus* var. *treleasei*) – BLM: Wyoming

Racemose milkvetch is a perennial forb found throughout the central United States (NatureServe 2013). In Wyoming, the species is endemic to the Green River Basin and eastern foothills of the Wyoming Range in Sublette and Uinta counties (Heidel and Fertig 2003). The species occurs on sparsely vegetated, shale-derived outwash flats and fluted Badland slopes (Heidel and Fertig 2003). WYNDD-modeled habitat for the species occurs in the Project area (WYNDD 2011).

Rock Hymenoxys (*Hymenoxys lapidicola*) – BLM: Utah

Rock hymenoxys is endemic to Uintah County in northeastern Utah and occurs in rock crevices in ponderosa pine-manzanita and pinyon-juniper communities between 6,000 and 8,100 feet (UNPS 2012). Occurrences of the species are located within 5 miles of transmission line alternative routes in the Uinta Basin in the BLM Vernal Field Office.

Rollins' Cat's-eye (*Cryptantha rollinsii*) – BLM: Colorado

Rollins' cat's-eye occurs on white shale slopes of the Green River Formation from 5,300 to 5,800 feet. Habitat includes pinyon-juniper or cold desert shrubland communities. Current known distribution includes Wyoming, Utah, and Colorado (Moffat and Rio Blanco counties) (CNHP 1997). There are numerous known occurrences in the Project area in Rio Blanco County, Colorado. Along Link C196 there are nine known occurrences near the Rio Blanco-Garfield County border. In Wyoming, there is a single occurrence in the Project area. This occurrence is located approximately 0.8 mile from Link W492 approximately 6 miles north of the Utah border.

Spanish Bayonet (*Yucca sterilis*) – BLM: Utah

Spanish bayonet is endemic to the Uinta Basin in Duchesne and Uintah counties, Utah. The species inhabits sandy soils in salt desert shrub, juniper, sagebrush, and shadscale communities at elevations from 4,790 to 5,800 feet (UNPS 2012). Five known occurrences are located within 5 miles of transmission line alternative routes in Uintah County, Utah. There is a single known occurrence in the Project area located along Link U321 at the mouth of Walker Hollow near the Green River southwest of Jensen. Additional occurrences are located within 2 miles of Link U400 south and east of the White River.

Stemless Beardtongue (*Penstemon acaulis* var. *acaulis*) – BLM: Wyoming; USFS: Ashley National Forest

Stemless beardtongue is a long-lived perennial forb endemic to southwestern Wyoming and northeastern Utah. It inhabits semi-barren substrates in pinyon-juniper and sagebrush-grass communities from 5,900 to 8,200 feet (NatureServe 2013). WYNDD-modeled habitat for the species occurs in the Project area in Wyoming (WYNDD 2011). The species is also a USFS sensitive species in the Ashley National Forest; however, no known occurrences of the species are found within 20 miles of the Project area in Utah (UNHP 2012).

Thompson's Talinum (*Talinum thompsonii*) – BLM: Utah

Thompson's talinum occurs on shallow, gravelly soils weathered from the Buckhorn Conglomerate (UDWR 1998), mainly composed of siliceous pebbles at 7,500 feet. Habitat includes pinyon-juniper and ponderosa pine communities. It is endemic to the Colorado Plateau in Emery County where it is known to occur on BLM and state lands (UNPS 2012). There are no known occurrences located in the Project area; however, all known occurrences of Thompson's talinum are located on Cedar Mountain in Emery County within 5 miles of the transmission line alternative routes for Link U730.

Twisted Buckwheat (*Eriogonum contortum*) – BLM: Colorado

Twisted buckwheat occurs on the Mancos Shale Badlands at 4,500 to 5,100 feet in shadscale and other salt desert shrub communities. It occurs in Utah and Colorado (Garfield and Mesa counties) (CNHP 1997). Twisted buckwheat is known to occur within the 1-mile buffer of the Project area along links in Grand and Mesa counties.

Uinta Basin Spring-parsley (*Cymopterus duchesnensis*) – BLM: Colorado

Uinta Basin spring-parsley occurs on sandy clay and clay semi-barrens of Mancos and Morrison Shales derived from the Morrison, Uinta, Wasatch, and Green River Formations from 4,700 to 6,800 feet elevation. The habitat is cold desert shrub, sagebrush, and juniper communities. The species is found in Utah (Uintah and Duchesne counties) and Colorado (Moffat and Rio Blanco counties) (CNHP 1997). The Uinta Basin spring-parsley is located within transmission line alternative routes in Duchesne and Uintah counties, Utah. In Colorado, only one occurrence is located within the 1-mile buffer of Link C196 along Salt Creek south of the Garfield-Mesa county line.

Untermann's Daisy (*Erigeron untermannii*) – BLM: Utah; USFS: Ashley National Forest

Untermann's daisy is endemic to the Tavaputs Plateau in Duchesne County, Utah (Welsh et al. 2008). It is found on calcareous shales and sandstones of the Uinta and Green River Formations in pinyon-juniper, mountain mahogany, limber pine, bristlecone pine (*Pinus longaeva*), and sagebrush communities between 7,000 and 9,400 feet in elevation (UNPS 2012). There are numerous known occurrences for the species along Link U432 within Ashley National Forest.

Wheeler's Angelica (*Angelica wheeleri*) – USFS: Uinta National Forest

Wheeler's angelica is endemic to Utah primarily along the Wasatch Front. It inhabits areas that are boggy or very wet typically in riparian communities, seeps, and springs from 5,380 to 10,000 feet in elevation (UNPS 2012) in Cache, Juab, Piute, Salt Lake, Sevier, and Utah counties (Welsh et al. 2008). Two occurrences are known from the junction of Salt Creek Canyon and McCune Canyon in Uinta National Forest approximately 5 miles from the transmission line alternative routes of Link U650.

E.6.2 Special Status Fish and Wildlife

E.6.2.1 Federally Listed Threatened, Endangered, Candidate, and Proposed Fish and Wildlife Species

Black-footed Ferret (*Mustela nigripes*) – FWS: Endangered, Experimental/Non-essential; State: Wyoming, Colorado, Utah

Regulatory Status

The black-footed ferret was designated as endangered by the Bureau of Sport Fisheries and Wildlife in 1966. The species was subsequently listed as threatened with extinction under the Endangered Species Preservation Act on March 11, 1967 (32 FR 4001) and as endangered under the ESA on June 2, 1970 (35 FR 8491–8498). No critical habitat has been designated for the species. Eight reintroduced black-footed ferret populations have been designated as Nonessential Experimental under Section 10(j) of the ESA. The FWS initiated a 5-year species status review for the black-footed ferret on July 7, 2005 (70 FR 39326–39327). In the 2008 status review summary, the FWS recommended no change in status and a Recovery Priority Number of 2C (FWS 2008b).

On December 17, 2012, FWS announced the availability of the *Draft Black-footed Ferret Programmatic Safe Harbor Agreement and Environmental Assessment* for comment by the public and federal, state,

tribal, and local agencies. The safe harbor agreement is part of a larger new multi-agency partnership to expand black-footed ferret recovery efforts. The comment periods for the safe harbor agreement closed on February 22, 2013.

The current Black-footed Ferret Recovery Plan was approved in 1988 (FWS 1988). This plan replaced the 1978 recovery plan, which was drafted when no extant, wild black-footed ferrets were thought to exist (Linder et al. 1978). The 1988 recovery plan does not include any delisting criteria for the species (FWS 1988). FWS published the Black Footed Ferret Spotlight Species Action Plan on August 19, 2009. The action plan provided some interim guidance for the recovery of the species. An updated recovery plan is expected to be available in 2014.

Taxonomy and Life History

The black-footed ferret was first formally described by John Audubon and James Bachman in 1851 (Clark 1986). The species is 1 of 14 members of the genus *Mustela* and 1 of 3 species in the Subgenus *Putorius*, which also includes the Siberian polecat (*Mustela eversmanni*) and the European polecat (*M. putorius*) (Hillman and Clark 1980). The black-footed ferret is endemic to North America and is the only ferret species native to the Americas (FWS 2008b). There are no recognized subspecies.

The black-footed ferret co-evolved with prairie dogs (*Cynomys* spp.) in North America and is considered to be a prairie dog obligate. The ferret is entirely dependent on prairie dog colonies, utilizing prairie dog burrows for shelter and den sites and preying almost exclusively on prairie dogs (Biggins 2006). Female black-footed ferrets become sexually mature at 9 months with prime breeding age occurring from 1 to 3 years old (Clark 1989). Ferrets breed between March and May and females can have multiple estrus cycles. Gestation lasts 42 to 45 days and kits are born between April and June (Hillman and Clark 1980). Average litter size is 3 kits (Forrest et al. 1988). Kits generally disperse in late September and early October, with males typically dispersing to different prairie dog towns and females remaining near their mother's home range (Clark 1989).

Black-footed ferrets are solitary except during the breeding season and when mothers are caring for kits. Ferrets are strongly nocturnal and spend much of the day below ground among several burrows (Clark 1989). The average lifespan of wild black-footed ferrets is 3 to 4 years.

Distribution and Habitat Requirements

As a prairie dog-obligate, the black-footed ferret is associated exclusively with prairie dog colonies in the grasslands and semi-desert shrublands of North America. The historical distribution of the black-footed ferret was closely associated with the ranges of the black-tailed prairie dog (*Cynomys ludovicianus*), the white-tailed prairie dog (*C. leucurus*), and the Gunnison's prairie dog (*C. gunnisoni*). The species historical range has been estimated at nearly 250 million acres across Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming as well as Alberta and Saskatchewan (Clark 1989).

The significant reduction in the distribution and abundance of prairie dogs throughout North America during the 20th century resulted in the near extirpation of the black-footed ferret (Esch et al. 2005). The species was thought to be extinct until the discovery of a small population near Meeteetse, Wyoming in 1981. After declining to 18 individuals, all members of the Meeteetse population were captured and placed in a captive breeding program in 1987 (FWS 1988). Since 1991, a total of 18 black-footed ferret reintroduction projects have been conducted in eight states and Mexico (FWS 2008b). Experimental, non-essential populations have been established at eight reintroduction sites in the United States including:

- Shirley Basin, Wyoming (56 FR 41473)
- Conata Basin/Badlands, South Dakota (59 FR 42682)
- Charles M. Russell National Wildlife Refuge, Montana (59 FR 42696)
- Aubrey Valley, Arizona (61 FR 11320)
- Coyote Basin, Colorado/Utah (63 FR 52823)
- Cheyenne River Sioux Reservation, South Dakota (65 FR 60879)
- Rosebud Sioux Reservation, South Dakota (68 FR 26498)

Reintroduction projects not utilizing the experimental, non-essential designation have been completed in Chihuahua, Mexico (2001), Lower Brule Indian Reservation, South Dakota (2006), Wind Cave National Park, South Dakota (2007), Espee Ranch, Arizona (2007), Logan County, Kansas (2007), Northern Cheyenne Indian Reservation, Montana (2008), and Vermejo Ranch, New Mexico (2008)(FWS 2008b).

Four reintroduction sites (Aubrey Valley, Cheyenne River Indian Reservation, Conata Basin, and Shirley Basin) currently meet the population objectives for reintroduced populations outlined in the 1988 Recovery Plan and are considered “successful” by the (FWS 2008b). Two populations (Badlands and Rosebud Sioux Reservation in South Dakota) are “improving”; four (Charles M. Russell National Wildlife Refuge, Coyote Basin, Wolf Creek, and Janos, Mexico) are “marginal”; and the remaining populations are either “unsuccessful” or too recent to categorize. The FWS currently estimates there are 422 breeding adult black-footed ferrets across all reintroduced populations (FWS 2008b).

Primary Threats to Survival

The historical decline in the black-footed ferret occurred concurrently with the reduction in the distribution and abundance of prairie dogs in North America. The primary causes of the species decline included conversion of native grassland habitats to agriculture, large scale eradication of prairie dogs, and disease (Esch et al. 2005). Despite several successful reintroductions, the black-footed ferret remains one of the most endangered mammals in the North America.

The current threats to species recovery include habitat loss and modification, disease, and the lack of adequate regulatory mechanisms (FWS 2008b). The FWS estimates that approximately 97 percent of suitable habitat from pre-European times has been lost, and the fragmentation/loss of large prairie dog colonies currently limits the ability of the remaining habitat to support ferrets. Sylvatic plague affects both ferrets and prairie dogs, and the disease continues to be a primary threat to the black-footed ferret. Plague has caused the suspension of reintroduction efforts at three sites and limited recovery at two other sites (FWS 2008b). In 2008, plague was documented in prairie dogs at Conata Basin, which supports the most successful reintroduced ferret population. Finally, the lack of regulatory mechanisms to protect prairie dog colonies from control and eradication efforts as well as recreational shooting currently represents a significant threat to the recovery of the black-footed ferret.

Occurrence in the Project Area

No known remnant black-footed ferret populations are known to occur in the study area. However, there are two reintroduction sites within the study area: the Shirley Basin/Medicine Bow Management Area (Shirley Basin) and the Northwestern Colorado/Northeastern Utah Black-footed Ferret Experimental Population Area (ExPA). The Shirley Basin site encompasses approximately 2,068 square miles in Carbon, Albany, and Natrona counties. This area is located approximately 20 miles northeast of Rawlins, Wyoming. The first release of captive-raised black-footed ferrets occurred in the Shirley Basin in 1991. Since that date, a total of 277 individuals have been released at this site that currently supports an estimated 196 individuals and represents the second largest black-footed ferret population in North America (FWS 2008b). Although the Shirley Basin supports the only known extant population of wild black-footed ferrets in Wyoming, there are numerous white-tailed prairie dog complexes within the

planning areas for both the BLM Rawlins and Rock Springs Field Offices that represent suitable habitat for the black-footed ferret.

The ExPA encompasses portions of Rio Blanco and Moffat counties in Colorado, Sweetwater County in Wyoming, and Uintah and Duchesne counties in Utah. The ExPA has been separated into the Northwestern Colorado Experimental Population Sub-Area and the Northeastern Utah Experimental Population Sub-Area. Within the Northwestern Colorado Sub-Area, the Little Snake Black-footed Ferret Management Area was established as a specific reintroduction site. The Little Snake area is located in northwest Moffat County, Colorado along the Colorado-Wyoming border. Within the Northeastern Utah Sub-Area, the Coyote Basin Black-footed Ferret Management Area was established as the specific reintroduction site. The Coyote Basin area is located in Uintah County, Utah, along the Utah-Colorado border.

A total of 255 black-footed ferrets have been released into the Coyote Basin Area since 1999. Reproduction was confirmed in Coyote Basin in 2000, and the population is currently estimated at 25 individuals (FWS 2008b). Ferret releases at the Wolf Creek site northeast of Rangely, Colorado, were initiated in 2001, and to date a total of 189 individuals have been released at this site. The Wolf Creek population is currently estimated at 16 individuals (FWS 2008b). The FWS classifies both populations as “marginal” (FWS 2008b).

Bonytail (*Gila elegans*) – FWS: Endangered; State: Colorado, Utah

Regulatory Status

The bonytail was first proposed for listing as an endangered species under the ESA on April 24, 1978, because of alteration and destruction of habitat that had greatly reduced populations and would continue to threaten their existence (43 FR 17375). The FWS determined the species to be endangered and released the final rule on April 23, 1980 (45 FR 27710). On March 21, 1994, FWS designated seven reaches of the Colorado River system, including portions of the Colorado, Green, and Yampa rivers in the Upper Basin and the Colorado River in the Lower Basin, totaling 312 miles of critical habitat for the species (59 FR 13374). On April 18, 2007, the FWS initiated a 5-year species status review (72 FR 19549). The bonytail is also included in the Lower Colorado River Multi-Species Conservation Program (2004).

A recovery plan for the bonytail was published on August 1, 2002. To address unique threats and site-specific management actions, the entire population of the bonytail has been reduced to upper and lower basin recovery units. The upper basin recovery subunit is composed of the Green River and upper Colorado basin and the lower basin recovery unit includes the mainstem and tributaries of the Colorado River from Lake Mead downstream to the southerly International Boundary with Mexico. The species may be downlisted from endangered to threatened, if during a 5-year period: (1) one (upper basin recovery subunit) and two (lower basin recovery subunit) genetically and demographically viable, self-sustaining populations of more than 4,400 adults are maintained; (2) a genetic refuge is maintained in a suitable location in the lower basin recovery unit such as Lake Mohave or Havasu; and (3) site-specific management tasks to minimize or remove threats have been identified, developed and implemented. Delisting can occur if all three goals listed above are maintained for an additional 3 years past downlisting and a necessary level of protection is attained (FWS 2002c).

Taxonomy and Life History

The bonytail was originally collected and described from the Zuni River, New Mexico, in 1853 by Baird and Girard of the Sitgreaves Expedition. It is commonly referred to as the bonytail chub and is a member of a unique assemblage of fishes native to the Colorado River Basin consisting of 35 species. It was once

considered a subspecies of the roundtail chub (*Gila robusta*) but has since been accorded full species status (FWS 2002c).

The bonytail is a relatively large cyprinid or minnow endemic to the Colorado River Basin. It is closely related to the roundtail chub and other endemic *Gila* species. It has unique morphological characteristics making it more adapted to the flow regimes of the historic Colorado River mainstem and tributaries. Adults are characterized by a small head and an elongated, laterally compressed body with a long, thin caudal peduncle and a slightly humped back (Nevada Department of Wildlife 2007). Adult bonytails can reach a maximum size of 22 inches (Bozek et al. 1984). The scales are small, reduced, or embedded and it has relatively small eyes, all thought to be adaptations to high silt loads that characterized the erosive, turbid Colorado River System prior to the construction of dams (Arizona Game and Fish Department [AZGFD] 2001). The narrow tail terminates in a V-shaped caudal fin (FWS 2002c).

Natural reproduction of the bonytail was last documented in the Green River in Dinosaur National Monument in the early 1960s (Vanicek and Kramer 1969). The species is a broadcast spawner, in the wild females released an estimated 10,000 adhesive eggs while hatchery females yield an average of 25,000 eggs (Hamman 1982). In Lake Mohave and the lower basin spawning occurs in May, whereas the upper basin spawning occurs in June and July. By 2002, more than 83,000 hatchery-reared bonytails had been released into Lake Mohave (Valdez and Clemmer 1982). In rivers, adults eat primarily terrestrial insects, plant debris, and algae while the young eat aquatic insects. In lakes, the bonytail has been observed feeding on algae and plankton (AZGFD 2001).

Distribution and Habitat Requirements

Formerly abundant throughout the Colorado River and its larger tributaries, the bonytail has been found from the Green River in Wyoming and Utah; the Yampa and Gunnison rivers in Colorado; the Colorado River in Arizona, Colorado, Nevada, and California; San Juan River in New Mexico; and the Gila and Salt rivers in Arizona (FWS 2002c). Presently, the bonytail is one of the most critically imperiled North American freshwater fishes. The only known wild bonytails are an unknown number of large, old adults in Lake Mohave on the lower Colorado River and scattered individuals in the upper Colorado River basin (AZGFD 2001). Known locations include the Yampa River in Dinosaur National Monument, the Green River in Gray and Desolation canyons, the Colorado River near Black Rocks (Kaeding et al. 1986) and Cataract Canyon (59 FR 13374), Lake Mohave near the Arizona-Nevada border, and Lake Havasu in Arizona and California (FWS 2002c).

The bonytail was historically common in warm-water reaches of larger rivers from Mexico to Wyoming. Little is known, however, about the specific habitat requirements of bonytails because the species was extirpated from most of its historic range prior to extensive fishery surveys (FWS 2002c). Current habitat is found in mid-sized to large rivers, usually near deep swift water, in flowing pools and backwaters, over mud or rocks (Valdez et al. 1990). It is hypothesized, based on available distribution data, that flooded bottomland habitats are important growth and conditioning areas for bonytails, particularly as nursery habitats for young (FWS 2002c).

Primary Threats to Survival

Threats to the species include streamflow regulation, habitat modification or destruction, and competition with, and predation by, nonnative fish species. Historically, the species inhabited the large turbid mainstream rivers of the Colorado River Basin that alternated between swift water canyons characterized by torrential rapids and slow, meandering, sand bottomed stretches. The Colorado River has been greatly altered by dams and diversions eliminating much of the bonytail's original habitat. Currently, the lower Colorado River basin is an alternating series of reservoirs and cold tailwaters that do not provide the warm water temperature needed for bonytails to spawn. Predation by introduced species is also likely to

have been an important factor in the decline of the species. Species such as bass, sunfish, catfish, red shiner, and the redbelt shiner have been suggested to be the main problem (45 FR 27710).

Occurrence in the Project Area

The bonytail is endemic to the Colorado River Basin, but no reproducing populations are thought to persist in the wild (FWS 2002c). The last documented capture of a bonytail in the Project area was during the late 1980s in Desolation/Gray Canyon (Carbon and Uintah counties, Utah). Designated critical habitat for the bonytail in the Project area includes portions of the upper Colorado River (northeast of Wayne County, Utah), portions of the Green River (north of Wayne County, Utah), and the Yampa River. Water depletions within the upper Colorado River system in Wyoming, Colorado, and Utah could affect bonytail or its habitat.

Boreal Toad (*Bufo boreas boreas*) – FWS: Petitioned; BLM: Wyoming, Colorado, Utah; USFS: Ashley, Manti-La Sal, and Uinta National Forests; State: Wyoming, Colorado, Utah

Regulatory Status

On April 12, 2012, the FWS announced a 90-day finding on a petition to list either the Eastern population or the Southern Rocky Mountain population of the boreal toad as a distinct population segment (DPS) that is endangered or threatened under the ESA and to designate critical habitat. Based on the review, FWS found that the petition presented substantial scientific or commercial information indicating that listing the as a DPS may be warranted. FWS initiated a 12-month review of the status of the eastern population to determine if listing it as a DPS is warranted.

Distribution and Habitat Requirements

The western (boreal) toad occurs in the montane areas associated with permanent water bodies in a variety of habitats including riparian, mountain shrub, mixed conifer, and aspen-conifer assemblages. It breeds in small pools, beaver ponds, reservoirs, and the backwaters and side channels of creeks and rivers. The Project area is located outside the known range and distribution of the species in Wyoming and Colorado (Keinath and McGee 2005), but is within the known range of the species in Utah (Hogrefe et al. 2005).

Primary Threats to Survival

The species is threatened by pollution, pesticide use, habitat loss, fragmentation, degradation, and disease. Populations in Utah have declined and extant populations are irregularly distributed within historic range (Hogrefe et al. 2005).

Occurrence in the Project Area

Three known occurrences are located within 1 mile of transmission line alternative routes in Utah. One is located south of Helper along Link U522; another is at Kyune along Link U524; and the third is located 4 miles north of Nephi along Link U650. The species is known to occur in Strawberry Reservoir, which lies within 3 miles of Link U420. The boreal toad may be present in the Project area in the Book Cliffs and San Pitch, Uinta, and Wasatch mountains and valleys.

Colorado Pikeminnow (*Ptychocheilus lucius*) – FWS: Endangered; State: Colorado, Utah

Regulatory Status

The Colorado pikeminnow was listed as endangered (as the Colorado River squawfish) under the Endangered Species Preservation Act on March 11, 1957 (32 FR 4001). With the 1973 passage of the

ESA, the fish retained its endangered status. On March 21, 1994 the FWS designated six reaches of the Colorado River System, including portions of the Colorado, Green, Yampa, White, and San Juan rivers, totaling 1,148 miles of critical habitat for the species (59 FR 13374). Two reintroduced Colorado pikeminnow populations have been designated as Nonessential Experimental under Section 10(j) of the ESA (50 FR 30188). An additional reintroduced population has been proposed for designation as a Nonessential Experimental (52 FR 32143), but the ruling has never been finalized. A 5-year review was initiated on April 18, 2007 (72 FR 19549).

The current Colorado Pikeminnow Recovery Plan was approved August 28, 2002. To address unique threats and site-specific management actions, the entire population of the Colorado pikeminnow has been reduced to three recovery subunits of the upper Colorado River Basin: the Green River, the upper Colorado River, and the San Juan River subbasins. The species may be downlisted from endangered to threatened, if during a 5-year period: (1) one genetically and demographically viable, self-sustaining population of more than 2,600 adults is maintained in the Green River subbasin recovery unit; (2) a self-sustaining population of at least 700 adults is maintained in the upper Colorado River subbasin recovery unit; (3) a target number of 1,000 age 5+ fish is established in the San Juan River subbasin recovery unit; and (4) site-specific management tasks to minimize or remove threats have been identified, developed and implemented. Delisting can occur if the three goals listed above are maintained for an additional 7 years past downlisting and a necessary level of protection is attained (FWS 2002a).

Taxonomy and Life History

The Colorado pikeminnow is the largest North American member of the minnow family (*Cyprinidae*). The estimated maximum total size is 6 feet and 80 pounds, although averages are believed to be less than 3 feet and between 4 to 9 pounds (Miller 1961). It is one of three large cyprinids of the genus *Ptychocheilus* native to the western United States. The species has a flattened head and elongated body. They are adapted to life in rivers with seasonally variable flow and high silt loads. The mouth is large and nearly horizontal with slender teeth adapted for grasping and holding prey. It is the top native carnivore of the Colorado River system. Small individuals feed primarily on waterfleas, copepods, and chironamids. Large adults prey mainly on other fish (FWS 2002a).

The Colorado pikeminnow spawns under decreasing flow regimen with increasing temperatures in summer when the water temperature is at least 68 to 72 degrees Fahrenheit (°F), generally after June. The pikeminnow makes an extensive spawning migration, with one recorded individual traveling 127 miles. They are broadcast spawners that deposit their eggs on cobble substrates in riffles and runs. Eggs hatch in less than 1 week when larvae then enter stream drift and are transported downstream for about 6 days, traveling an average distance of 99 miles to reach low gradient nursery areas. The Colorado pikeminnow becomes mature in 5 to 7 years and may live 30 years or more. Natural reproduction has been recently observed in the Green, Yampa, upper Colorado, Gunnison, and San Juan rivers (FWS 2002a).

Distribution and Habitat Requirements

The Colorado pikeminnow was once widespread in the large rivers of the Colorado River and major tributaries, but present distribution is drastically reduced from the original. The pikeminnow has not been seen below Glen Canyon Dam since 1968. The three remaining wild populations are found in the Green, upper Colorado, and San Juan River Subbasins. In the Green River Subbasin, the species is seen in the Green River (from Lodore Canyon to the Colorado River Confluence), Yampa River (from Craig, Colorado, to the Green River Confluence) (FWS 2002a), Little Snake River (Wyoming to the Yampa River Confluence) (Marsh et al. 1991), White River (Taylor Draw Dam to the Green River Confluence), Price River (lower 89 miles above Green River confluence), and the Duchesne River (lower 6.2 miles above the Green River confluence). In the Upper Colorado River Subbasin, Colorado pikeminnow are known to inhabit the Upper Colorado River (from Palisade, Colorado, to Lake Powell inflow), the

Gunnison River (lower 33 miles above Colorado River confluence), and the Dolores River (lower 1.2 miles above Green River confluence). And in the San Juan River Subbasin, the species is seen only in the San Juan River (from Shiprock, New Mexico, to Lake Powell Inflow) (FWS 2002a). The last wild Colorado pikeminnow was caught in 1975 in the lower Colorado River (Minckley et al. 2003).

A refuge population was successfully established at the Dexter National Fish Hatchery in Dexter, New Mexico. From 1981 to 1990, as many as 623,000 Colorado pikeminnow from the refuge population were reintroduced to two designated non-essential experimental population locations in the Gila River drainage of Arizona:

- Salt River (Gila County) – from Roosevelt Dam upstream to U.S. Highway 60 Bridge
- Verde River (Gila and Yavapai counties) – from Horseshoe Dam upstream to Perkinsville (50 FR 30188)

A rule was proposed in 1987 to designate an additional non-essential experimental population in the Colorado River Basin, but has never been finalized:

- Lower Colorado River (Yuma and LaPaz counties, Arizona and Imperial, Riverside, and San Bernadino counties, California) – between Imperial and Parker Dams (52 FR 32143)

The Colorado pikeminnow is found in warm-water reaches of the Colorado River mainstem and larger tributaries. Adults have been found in various habitats including deep, turbid strongly flowing water; eddies; runs; flooded bottoms; and backwaters. Lowlands inundated during spring high flow appear to be important habitats for health and reproductive conditioning as the fish use these habitats to offset winter stress and replenish energy stores needed for long migrations and spawning. In winter, adults are most commonly found in shallow, ice-covered shoreline areas (FWS 2002a).

Adults migrate long distances (Tyus and McAda 1984) and seek white-water canyons as breeding grounds. They appear to select river canyons receiving groundwater discharge from sandstone/limestone seeps and return to the same spawning site every year. Only two principal spawning sites have been identified, both in the Green River Subbasin. One site is near Three Fords Canyon in Gray Canyon of the Lower Green River and the other is in the lower 20 miles of the Yampa River (FWS 2002a). After hatching, the larvae drift downstream, and then move to shoreline areas and backwaters. Postlarval pikeminnow occupy shallow, ephemeral backwaters formed in late summer by receding water levels (UDWR 1997).

Primary Threats to Survival

Threats to the Colorado River Basin endangered fishes include streamflow regulation, habitat modification or destruction, and competition/predation from nonnative fish species. Historically, the species inhabited the large turbid mainstream rivers of the Colorado River Basin that alternated between swift water canyons characterized by torrential rapids and slow, meandering, sand bottomed stretches. The Colorado River has been greatly altered by dams and diversions eliminating much of the Colorado pikeminnow original habitat. Currently, the lower Colorado River basin is an alternating series of reservoirs and cold tailwaters that do not provide the warm water temperature needed for the pikeminnow to spawn. Predation by introduced species is also likely to have been an important factor in the decline of the species. Species such as bass, sunfish, catfish, red shiner, and the reidside shiner have been suggested to be the main problem as they are efficient predators that prey on the eggs and young (45 FR 27710).

Occurrence in the Project Area

The Colorado pikeminnow is endemic to the Colorado River Basin. In the Project area, there are two remaining populations of the Colorado pikeminnow located in the Green and upper Colorado River Basins. Designated habitat in the Project area includes portions of the upper Colorado and Green rivers north of Wayne County, Utah and the Price, Gunnison, White, Little Snake, Duchesne, and Dolores rivers. The only two known spawning sites of the species are also in the Project area near Three Forks Canyon in the Gray Canyon area of the Green River (Carbon and Uintah counties) and the lower 20 miles of the Yampa River (Moffat County, Colorado). Water depletions within the upper Colorado River system in Wyoming, Colorado, and Utah could affect Colorado pikeminnow or its habitat.

Greater Sage-grouse (*Centrocercus urophasianus*) – FWS: Candidate; BLM: Wyoming, Colorado, Utah; State: Wyoming, Colorado, Utah

Regulatory Status

The greater sage-grouse is regulated by a complex and evolving array of federal and state regulations.

Federal Regulations and Policies

On March 4, 2010, the greater sage-grouse became a candidate species for listing as threatened or endangered under the ESA of 1973 (75 FR 13909). Prior to this rule, the FWS had listed the Washington state population of sage-grouse as a candidate for federal listing in 2001 (66 FR 22984). In both rules, the FWS stated that formal listing for the species is warranted, but is precluded by other higher priority listing actions. As a condition of a court approved settlement agreement, the FWS must make a final listing determination by the end of fiscal year 2015.

In addition to its candidate status, the greater sage-grouse is listed as a sensitive species by the BLM in all three states crossed by the Project and by the states of Wyoming, Colorado, and Utah. The USFS lists the greater sage-grouse as a sensitive species on all Forests crossed by the Project and as a Management Indicator Species (MIS) on the Ashley National Forest.

BLM Regulations and Policies

Current BLM sage-grouse management is guided by the documents listed below.

- BLM sensitive species are managed according to guidance provided by *BLM Manual 6840*. In addition to *BLM Manual 6840*, the BLM has issued national-level and state-level Instructional Memorandums that provide additional guidance for the management of sage-grouse. The BLM is currently revising applicable Land Use Plans to incorporate sage-grouse conservation measures. These amendments may lead to some changes sage-grouse regulations and policies in the reasonably foreseeable future.
- In November 2004, the BLM Washington Office released its *National Sage-Grouse Habitat Conservation Strategy* (BLM 2004), which provides a framework for future conservation efforts by setting out broad goals and specific actions to meet those goals.
- In March 2010, the BLM Washington Office issued WO IM 2010-071 *Gunnison and Greater Sage-grouse Management Considerations for Energy Development* (BLM 2010b). These management considerations supplement the *National Sage-Grouse Habitat Conservation Strategy*. This IM identifies management actions necessary at some sites to ensure environmentally responsible exploration, authorization, leasing, and development of renewable

and non-renewable energy resources within the ranges of the Gunnison sage-grouse and greater sage-grouse.

- In December 2011, the BLM Washington Office issued WO IM 2012-043 *Greater Sage-Grouse Interim Management Policies and Procedures* (BLM 2011c), which provides interim conservation measures that are applied to sage-grouse and sage-grouse habitats while BLM land use plan revisions are occurring.
- In February 2012, the BLM Wyoming State Office issued WY IM 2012-019 *Greater Sage-Grouse Habitat Management Policy on Wyoming Bureau of Land Management Administered Public Lands* including the Federal Mineral Estate (BLM 2012c). This IM provides guidance to BLM Wyoming Field Offices on sage-grouse habitat management for proposed activities and resource management planning.

USFS Regulations and Policies

USFS Manual 2670 contains legal authorities, objectives, policies, responsibilities, instructions, and guidance that direct the USFS when planning and executing assigned programs and activities. In October 2012, the USFS published *Interim Conservation Recommendations for Greater Sage-grouse and Greater Sage-grouse Habitat for Regions 1, 2, and 4*. These recommendations supplement the recommendations for sage-grouse contained in the *Chief's Letter to Regional Foresters in Regions 1, 2, 4, 5 and 6 for Sage-grouse and Sagebrush Conservation* (July 2010). These recommendations also promote consistency in management of activities on USFS land with BLM IM 2012-043. Additionally, the USFS is currently revising applicable Land and Resource Management Plans (LRMP) to incorporate sage-grouse conservation measures.

State Regulations and Policies

In June 2003, Wyoming issued a statewide *Greater Sage-Grouse Conservation Plan* (State of Wyoming 2003). The plan was developed by the Wyoming Sage-Grouse Working Group and provides goals, tasks, and recommended management practices to guide sage-grouse planning and management efforts. In June 2011, the Governor of State of Wyoming issued Executive Order 2011-5, *Greater Sage Grouse Core Area Protection* (State of Wyoming: Office of the Governor 2011), which revised previous designations of sage-grouse core population areas, provided guidance specific to the siting and permitting of projects in core areas and established utility corridors within core areas.

In January 2008, the CPW issued the *Colorado Greater Sage-grouse Conservation Plan* (Colorado Greater Sage-grouse Steering Committee 2008). The purpose of the plan is to facilitate the conservation of greater sage-grouse and their habitats in Colorado. It identifies conservation measures and strategies to achieve this purpose. The plan is guided by local sage-grouse working groups. The *Conservation Plan for Greater Sage-grouse in Utah* was approved by the Governor in April 2013. The plan establishes incentive-based conservation programs for conservation of sage-grouse on private, local government, and School and Institutional Trust Lands Administration lands and regulatory programs on other state- and federally managed lands. The Conservation Plan also establishes sage-grouse management areas and implements specific management protocols within these areas. In addition to the conservation plan, UDWR published a *Greater Sage-Grouse Management Plan* in 2009 (UDWR 2009b). The management plan guides management of sage-grouse in Utah and seeks to protect, maintain and improve sage-grouse populations and habitats.

Wyoming Sage-grouse Local Working Groups

The Project would affect two conservation areas overseen by local sage-grouse working groups in Wyoming (from east to west): Bates Hole/Shirley Basin and South-central. These working groups have developed a non-binding conservation plan for sage-grouse management. All of the Wyoming working groups are in the process of updating their plans to bring them into compliance with Executive Order 2011-5 and WY IM 2012-019. The Wyoming working groups are also updating their plans with any other new information, changes, and/or occurrences.

Colorado Sage-grouse Local Working Groups

The Project would affect three conservation areas overseen by local sage-grouse working groups in Colorado (from east to west): Northwest Colorado, Piceance/Parachute/Roan Creek, and Pinon Mesa. These working groups have developed a non-binding conservation plan for sage-grouse management.

Utah Sage-grouse Local Working Groups

The Project would affect three conservation areas overseen by local sage-grouse working groups in Utah: Uinta Basin, Strawberry Valley and Castle County. These working groups have developed a non-binding conservation plan for sage-grouse management.

Taxonomy and Life History

Greater sage-grouse are the largest grouse found in North America, and are uniquely adapted to and dependent on sagebrush (*Artemisia* spp.) for survival. In the 1990s, researchers documented morphological, behavioral and genetic evidence suggesting that sage-grouse in southwestern Colorado and southeastern Utah were distinct from sage-grouse elsewhere across their range (Hupp and Braun 1991; Kahn et al. 1999; Oyler-McCance et al. 1999; Young et al. 1994). In 2000 the Gunnison sage-grouse (*C. minimus*) was formally recognized by the American Ornithologist's Union (AOU) as a distinct species with sage-grouse across the remainder of the range being renamed greater sage-grouse (*C. urophasianus*). Although as far back as the 1940s researchers have argued for subspecies classification between sage-grouse in eastern (*C. u. urophasianus*) and western (*C. u. phaios*) portions of the species' range (Aldrich 1946; Aldrich 1963; Aldrich and Duvall 1955), and morphological, behavioral and genetic differences among some populations have been documented (Aldridge et al. 2008; Oyler-McCance et al. 2005; Taylor and Young 2006), individuals are not differentiated at a distinct geographic boundary and the FWS is currently not considering listing at the level of subspecies.

Sage-grouse are polygamous and exhibit consistent breeding behavior on ancestral strutting grounds (leks) annually (Patterson 1952). During the breeding season, males display in early morning and evening hours, traveling up to 2.1 kilometers (Ellis et al. 1987) from the lek to day-use feeding and resting areas. Sage-grouse females retire into the vicinity of their nest location within a few days of being bred, and remain relatively sedentary until they nest (Patterson 1952). A majority of sage-grouse females nest within 4 miles of the lek where bred (Colorado Greater Sage-grouse Steering Committee 2008). No concealment strategies are attempted at the nest except that afforded by natural cover and the female's cryptic plumage coloration pattern (Rasmussen and Griner 1938). Egg laying takes 7 to 10 days, incubation lasts 25 to 29 days, and average clutch sizes are between 6.5 and 9.1 eggs (Patterson 1952; Schroeder et al. 1999). Reproductive effort (nesting propensity) estimates in sage-grouse range from 63 to 100 percent (Connelly et al. 2011); however, research on follicular development indicates that between 91 and 98 percent of females breed annually (Braun 1979). Re-nesting rates less than 40 percent are typically reported (Connelly et al. 2011); however, Schroeder (1997) reported re-nesting rates greater than 80 percent in Washington. Sage-grouse are relatively long lived tetraonids, thus re-nesting may not be beneficial after weighing the benefits and costs of the increased parental investment in a second clutch.

(Bergerud 1988). Nesting success in sage-grouse ranges from 15 to 86 percent and is typically around 50 percent (Connelly et al. 2011). Sage-grouse chicks are precocial and move immediately following hatch to search for food (Patterson 1952); females generally rear their broods for the first 2 to 3 weeks in immediate vicinity of their nest (Berry and Eng 1985; Connelly 1982). Most chick mortality occurs prior to the flight stage (2 to 3 weeks) when decreased mobility increases vulnerability to predation and starvation (Autrient 1981; Patterson 1952). Sage-grouse broods remain in sagebrush habitats until range desiccation induces them to move to habitats still supporting succulent vegetation (Fischer et al. 1993; Neel 1980; Peterson 1970; Wallestad 1971). Brooding females may remain in upland habitats if suitable microsite conditions (e.g., swales, ditches, and springs) are found (Fischer et al. 1996; Hausleitner 2003; Wallestad 1971) or if weather conditions result in forbs remaining succulent in these habitats throughout the summer (Holloran 1999). The beginning of late brood-rearing coincides with forb desiccation but also with changes in chick diets from predominantly insects to forbs (Drut et al. 1994; Klebenow and Gray 1968; Patterson 1952; Peterson 1970). Late brood-rearing habitats are generally used from July to early September (Connelly et al. 1988; Dalke et al. 1963; Gill and Glover 1965; Patterson 1952; Savage 1969; Wallestad 1971). Fall is a transitional period for sage-grouse (Wambolt et al. 2002), during which sage-grouse diets change from a variety of forbs, insects, and sagebrush to predominantly sagebrush (Gill 1965; Leach and Hensley 1954; Patterson 1952; Rassmussen and Griner 1938; Wallestad et al. 1975). A precipitation event (usually snow) or a drop in the temperature initiates migration, which begins in late August (in advance of snow accumulation) and may continue into December (Berry and Eng 1985; Connelly et al. 1988; Dalke et al. 1960). During periods of early, severe winter snowstorms sage-grouse may begin migrations to winter habitats, but at the onset of milder weather later in the fall may return to sites adjoining late brood-rearing habitat (Patterson 1952). Sage-grouse may travel many kilometers or only short distances during fall migrations (Eng and Schladweiler 1972); migratory populations often travel 80 to 160 kilometers to winter ranges (Patterson 1952), while sedentary populations increase flock size and move from meadows into nearby sagebrush habitats during winter (Autrient 1981).

Distribution and Habitat Requirements

Sage-grouse were historically distributed throughout the Intermountain and northwestern United States and southern regions of three Canadian provinces (Schroeder et al. 2004). Pre-settlement distributions included western Nebraska and the Dakotas, all of Montana, Idaho, Wyoming, Nevada and Utah, northwestern New Mexico, northern Arizona, western Colorado, portions of eastern California, Oregon and Washington, and southern British Columbia, Alberta, and Saskatchewan. Sage-grouse currently occupy 56 percent of the historical distribution, and are no longer found in Arizona, New Mexico, Nebraska or British Columbia (Schroeder et al. 2004). The Western Association of Fish and Wildlife Agencies recently defined 7 sage-grouse management zones that reflect ecological similarities and population linkages instead of political boundaries (Knick and Connelly 2011; Stiver et al. 2006). Sage-grouse Management Zone I (Great Plains) includes sage-grouse populations in eastern Montana, northeastern Wyoming, North and South Dakota, Saskatchewan, and Alberta. The Wyoming Basin Management Zone (II) consists of populations mostly in Wyoming and northwestern Colorado, but also including south-central Montana, and far southeastern Idaho and northeastern Utah. Management Zone III (Southern Great Basin) includes populations primarily in southern Nevada and Utah but includes parts of California. The Snake River Plains (IV) includes sage-grouse populations primarily in Idaho, northern Nevada and eastern Oregon, but also includes northwestern Utah and southwestern Montana. Management Zone V (Northern Great Basin) includes populations in Oregon, California, and Nevada; Management Zone VI (Columbia Basin) includes populations in Washington; and Management Zone VII (Colorado Plateau) includes populations in Utah and Colorado (Knick and Connelly 2011). The highest densities of sage-grouse occur in Management Zones I, II, IV and V (Connelly et al. 2004).

Sage-grouse population persistence has been linked to the availability of sagebrush habitat; the dependence of the species on sagebrush through all seasonal periods has been well documented (Connelly

et al. 2004). Sage-grouse are considered a landscape-scale species as populations generally inhabit and rely on large, interconnected expanses of sagebrush (Connelly et al. 2004). Connelly et al. (2011) report that sage-grouse populations typically occupy habitats with a diversity of species and subspecies of sagebrush interspersed with a variety of other habitats (e.g., riparian meadows, agricultural lands, grasslands, sagebrush habitats with some conifer or deciduous trees); these habitats are usually intermixed in a sagebrush-dominated landscape and are often used by sage-grouse during certain times of the year (e.g., summer) or during certain years (e.g., above normal snow pack). Populations generally exhibit one of three potential migratory patterns (Connelly et al. 2000): (1) non-migratory, where sage-grouse do not make long-distance movements between or among distinct seasonal ranges; (2) one-stage migratory, where sage-grouse move between two distinct seasonal ranges (e.g., distinct winter areas and integrated breeding and summer areas); or (3) two-stage migratory, where sage-grouse move among three distinct seasonal ranges (e.g., distinct winter, breeding and summer areas). Although migratory populations may use a large area, there are specific seasonal habitats used by the population that may be spatially isolated; corridors of sagebrush-dominated habitats are used by individuals to move among these seasonal ranges (Connelly et al. 2003). For non-migratory populations, Connelly et al. (2003) suggest that seasonal habitats are generally well interspersed with no major anthropogenic barriers (e.g., reservoirs) between habitats.

Leks are situated in areas with minimal shrub cover adjacent to relatively dense sagebrush stands where strutting male exposure is maximized, but escape, thermal, and feeding cover is readily available (Gill 1965; Patterson 1952). An important characteristic for leks may be their proximity and configuration with nesting habitat (per theories of lek evolution and mating behavior) (Gibson 1996). In non-migratory populations, leks generally occur within nesting habitat, and may be situated near the center of seasonal ranges (Eng and Schladoweiler 1972; Wallestad and Pyrah 1974; Wallestad and Schladoweiler 1974). In migratory populations, female dispersal routes between wintering and nesting areas may influence the locations of leks (Bradbury et al. 1989; Dalke et al. 1963; Gibson 1996; Wakkinen et al. 1992). Selection of specific habitat features within a landscape by nesting sage-grouse has been extensively documented. Across the range of the species, nesting sage-grouse consistently select areas with more sagebrush canopy cover and taller grasses compared to available habitats, and tall, dense herbaceous cover – including residual (e.g., standing dead) herbage – in selected dense sagebrush stands generally tends to increase the probability of a successful hatch (Hagen et al. 2007; Holloran 2005). Recent research suggests sage-grouse select nesting habitat at multiple spatial scales: selection is for sagebrush canopy cover at the site scale, for high-density sagebrush and flat topography at the patch scale, and against conifer, grassland and riparian cover at larger scales (Doherty 2008). Females show strong fidelity to nesting areas, generally selecting nest locations within 0.5 to 1 kilometer from previous years' nests (Fischer et al. 1993; Holloran et al. 2005). Additionally, fidelity of female offspring to their natal home ranges has been observed (e.g., yearling females nesting close to their natal nest), suggesting that family groups of females may inhabit relatively distinct areas (Thompson 2012). Thermal and predator protection of young chicks (e.g., dense sagebrush stands) (Thompson et al. 2006) and food availability (e.g., insects and succulent forbs) (Drut et al. 1994; Johnson and Boyce 1990) are important for chick survival during the early brood-rearing period (hatch through 2-weeks post-hatch). Protein-rich foods are additionally required for optimal development 10 to 45 days post-hatch (Johnson and Boyce 1990). Stand structure and food availability are characteristics most frequently associated with habitat selection by sage-grouse during the summer (Aldridge and Brigham 2002; Autrient 1981; Klebenow 1969). Sage-grouse may use a variety of sagebrush habitats and other habitats (e.g., riparian, wet meadows and irrigated agricultural fields adjacent to sagebrush habitats) during summer, but tend to select feeding habitat near edges of sagebrush-dominated security cover types (Dunn and Braun 1986). Hagen et al. (2007) suggested that sage-grouse select areas with increased forb and grass cover during late brood-rearing periods (greater than 6 weeks post-hatch). Selection of wintering habitats by sage-grouse is influenced by snow depth and hardness, topography (i.e., elevation, slope, and aspect), and vegetation height and density (Batterson and Morse 1948; Gill 1965; Greer 1990; Schroeder et al. 1999); during the winter, sage-grouse rely almost

exclusively on sagebrush exposed above the snow for forage and shelter (Connelly et al. 2000; Crawford et al. 2004; Patterson 1952; Rassmussen and Griner 1938; Remington and Braun 1985; Robertson 1991; Schroeder et al. 1999). In certain areas and during certain winters when snow depths are sufficient to cover most sagebrush plants, suitable winter habitat (e.g., areas where plant exposure above the snow is maintained) may be the most limiting seasonal habitat (Beck 1977; Patterson 1952) with sage-grouse over a broad summering area congregating on smaller, traditional wintering grounds (Beck 1977; Berry and Eng 1985).

Primary Threats to Survival

Current sage-grouse breeding populations throughout western North America are approximately two to three times lower than those during the late 1960s, and populations declined on average 2 percent annually from 1965 to 2003 (Connelly and Braun 1997; Connelly et al. 2004) reported that long-term population declines prior to 1994 in states historically supporting the largest sage-grouse populations (Colorado, Idaho, Montana, Oregon, Wyoming) averaged 30 percent; in states and Canadian provinces historically supporting smaller populations, breeding populations declined by an average of 37 percent. Lek sizes and average rates of change in male numbers declined between 1965 and 2007 for 6 of the 7 Management Zones, and 2 Management Zones – Columbia Basin (VI) and Colorado Plateau (VII) – are projected to decline below an effective population size of 500 individual males in the next 30 years if current population trends continue (Garton et al. 2011). For the majority of management zones (86 percent), population change was best described by declining carrying capacity through time (Connelly et al. 2011), supporting conclusions that habitat quantity and quality are continuing to decline across the sagebrush biome (Connelly et al. 2004).

Potential factors contributing to sage-grouse range-wide declines includes many human caused impacts on the species and its habitats. The fundamental characteristics of the sagebrush biome that have been altered from pre-settlement conditions are grouped into 3 categories – habitat loss, habitat degradation, and habitat fragmentation (Braun 1998) i.e., (1) the total area dominated by sagebrush habitats has been reduced; (2) the composition and structure of (i.e., the vegetation and soils of) sagebrush communities has been negatively altered, including increased abundance and performance of invasive species and decreased abundance and performance of native species; and (3) roads, power lines, fences, energy developments, urbanization and other anthropogenic features have transformed large expanses of habitat into smaller pieces (Connelly et al. 2004; Fahrig 2003). Other factors such as hunting, predation, and drought have also been implicated (Braun 1998). The relative importance of these individual factors most likely has varied over the range of the sage-grouse as well as through time.

The primary contributors to permanent habitat loss in the sagebrush biome include agricultural conversion and urbanization, although one could convincingly argue that the ultimate result of the domination of a site by invasive annual grasses constitutes permanent habitat loss. As an example, cultivated agriculture – primarily cropland – covers more than 230,000 square kilometers (56.8 million acres; 11 percent) of the total land area within the estimated historic distribution of sage-grouse (Knick et al. 2011). Areas converted to croplands are generally those with deeper, loamy soils that are able to be irrigated while sagebrush remains in arid areas where soils and topography are limiting to crops; agriculture has replaced 75 percent of the shrub steppe in deep soils suggesting a majority of the most productive sage-grouse habitats no longer exist (Connelly et al. 2004). Agricultural development can also indirectly influence sage-grouse by providing access to sagebrush habitats for predators such as domestic cats, red fox (*Vulpes vulpes*) and corvids (Connelly et al. 2004). Habitat degradation is exemplified by the long-term consequences of overgrazing by livestock at the turn of the 19th century as well as the proliferation of invasive annual grasses (e.g., cheatgrass [*Bromus tectorum*]), especially in the Great Basin. (Miller et al. 2011) estimate that approximately 65 percent of the Great Basin ecoregion has conditions that put it at moderate to high risk of cheatgrass invasion. Dominance of a site by cheatgrass shortens fire-return

intervals, which—as most species of sagebrush are killed by fire—ultimately results in the conversion of a sagebrush-dominated site to a cheatgrass monoculture providing little to no habitat value for sage-grouse (Epanchin-Niell et al. 2009; Knapp 1996; Rowland et al. 2010). The major influence of livestock grazing on sage-grouse habitat is the potential to cause a transition from an ecological state dominated by sagebrush and cool season bunchgrasses to a site dominated by sagebrush and rhizomatous grasses, invasive annual grasslands or woodlands – all providing sage-grouse with either lower quality or no habitat value (Pyke 2011). Unmanaged overuse of sage-grouse habitats by wild horses and ungulates (e.g., elk, deer, and pronghorn) can have similar negative effects as livestock grazing. The transition to a lower quality condition can occur in 10 to 15 years at any given site under heavy uncontrolled grazing, and once a site has transitioned to a grazing tolerant state it will not revert without active restoration, even if the mechanism causing the conversion is eliminated (Connelly et al. 2004). Habitat fragmentation is generally the result of the addition of anthropogenic infrastructure to sagebrush habitats (e.g., roads, transmission lines, energy developments, fences). Mean sagebrush patch size within an 18-kilometers area was more the 9 times as large in occupied versus extirpated sage-grouse range (Wisdom et al. 2011). Paved roads exist in most sagebrush regions in densities up to greater than 5 kilometers per square kilometer, less than 5 percent of the sage-grouse range is greater than 2.5 kilometers from a paved road, and almost no area of sagebrush is greater than 6.9 kilometers from a paved road (Knick et al. 2011). Of 14 studies investigating the response of sage-grouse populations to energy development, (Naugle et al. 2011) reported that none indicated a positive influence, and the indirect effects of energy development on sage-grouse populations have been documented to 18 kilometers (Johnson et al. 2011).

Occurrence in the Project Area

All of the alternative routes cross sage-grouse habitats in Management Zones II and III, with the potential to cross habitats in Management Zone VII also existing. In Wyoming, the alternative routes cross two core areas (WGFD 2010b) and the entire length of each transmission line alternative route traverses occupied sage-grouse habitat. Active sage-grouse leks are located throughout sage-grouse habitats in Wyoming and all of the alternative routes cross within 4 miles of known active leks (WGFD 2012). In Colorado, approximately 30 to 50 percent of each alternative route crossed preliminary priority sage-grouse habitats (CPW 2012a), and the majority of the alternative routes traverse preliminary general sage-grouse habitat. Active sage-grouse leks are primarily located in preliminary priority sage-grouse habitats in Colorado and all of the alternative routes cross within 4 miles of known active leks in Moffat County (CPW 2012b). In Utah, populations of sage-grouse are more isolated with many distinct areas supporting sage-grouse occurring throughout the Project area. All alternative routes in Utah cross occupied sage-grouse habitat to some extent, with the northern alternative routes crossing between 5 and 10 distinct population areas and the southern-most routes crossing between 3 and 4 distinct population areas (UDWR 2011c). Active sage-grouse leks are distributed throughout sage-grouse habitats in Utah and all of the northern alternative routes cross within 4 miles of known active leks (UDWR 2013a). The southern-most alternative routes in Utah would not cross within 4 miles of active sage-grouse leks (UDWR 2013a).

Humpback Chub (*Gila cypha*) – FWS: Endangered; State: Colorado, Utah

Regulatory Status

The humpback chub was listed as endangered under the Endangered Species Preservation Act on March 11, 1967 (32 FR 4001). With the 1973 passage of the ESA, the fish retained its endangered status. On March 21, 1994 the FWS designated seven reaches of the Colorado River system including portions of the Colorado, Green, and Yampa rivers in the Upper Basin and portions of the Colorado and Little Colorado rivers in the Lower Basin, totaling 379 miles of critical habitat for the species (59 FR 13374). On April 18, 2007, the FWS initiated a 5-year species status review (72 FR 19549). The humpback chub is also included in the Lower Colorado River Multi-Species Conservation Program (2004).

The current recovery plan for the humpback chub was published in 1990 and amended in 2002. The species may be downlisted from endangered to threatened, if during a 5-year period: (1) the numbers of adults in the six extant populations do not decline significantly; (2) the recruitment of age-3 naturally produced fish equals or exceeds mean annual adult mortality for each of the six extant populations; (3) two genetically and demographically viable, self-sustaining populations of more than 2,100 adults are maintained; and (4) site-specific management tasks to minimize or remove threats have been identified, developed and implemented. Delisting can occur if the four goals listed above are maintained for an additional 3 years past downlisting and a necessary level of protection is attained (FWS 2002d).

Taxonomy and Life History

The humpback chub was first described by Miller in 1946. Prior to that time, the humpback chub was considered part of the *Gila robusta* (roundtail chub) complex.

The humpback chub is a medium-sized unusually shaped fish of the minnow family (*Cyprinidae*). The head is narrow, flattened and generally dorsally concave with a long fleshy snout and small eyes. The mouth is inferior-subterminal. There is a pronounced dorsal hump that begins at the dorsal origin of the gill covers, protrudes anteriorly, and then ends at the origin of the dorsal fin. It is believed that the odd shape of the fish aids in fast water by pushing the fish to the bottom where the current would be slower and would expend less energy to hold position. The grooves in the hump may also aid in directing water to the fish's gills (FWS 2002d).

The humpback chub evolved in seasonally warm and turbid waters and is highly adapted to unpredictable hydrologic conditions that occurred in the Colorado River System prior to extensive damming. Spawning of the humpback chub occurs in spring shortly after peak flow (Gorman and Stone 1999). In the Little Colorado River of Arizona, individuals moved upriver in early spring and slowly back downstream post-reproductively. Humpback chubs are opportunistic omnivores that are known to eat insects, crustaceans, plants, seeds, and occasionally small fish, reptiles, and amphibians depending on availability (FWS 2002d).

Distribution and Habitat Requirements

Historically, the humpback chub was found throughout the Colorado River basin from western Colorado and Wyoming to northern Arizona in the Colorado, Green, lower Yampa, and White rivers. Currently, there are six known self-sustaining populations consisting of 7,300 to 13,800 wild adults. Five occur in the Upper and one on the Lower Basin Recovery Units. The Upper Recovery Unit consists of populations on the Colorado River (Black Rocks and Westwater Canyon in Utah and Cataract Canyon of Colorado), one population on the Yampa River (Yampa Canyon in Colorado), and on the Green River (Desolation/Gray Canyons of Utah). The only population in the Lower Basin Recovery Unit occurs on the mainstem Colorado River in Marble and Grand Canyons and the Little Colorado River. A small number of humpback chub have been captured in the Green River in Dinosaur National Monument, but are not considered to be a self-sustaining population (FWS 2002d).

Humpback chubs are found in large rivers in a variety of habitats. Adults have been found in deep turbulent currents, shaded canyon pools, areas under shaded ledges in moderate current, riffles, and eddies (FWS 1994b). Young and spawning adults are generally found in sandy runs and backwaters (FWS 1990b).

Primary Threats to Survival

The current primary threats to the humpback chub are loss fragmentation, and modification of habitat due to construction and operation of the Hoover Dam. The dam has led to impoundment of streams causing

stream inundation, reduced water temperatures, reduced spring flow, and increased daily fluctuation in flow. Decreased temperatures and flow reduction may impede successful spawning and increase competition with other species. As with the other Colorado River Basin endangered fishes, predation by introduced species is also likely to have been an important factor in the decline of the species. Species such as bass, sunfish, catfish, red shiner, and the redbelly shiner have been suggested to be the main problem (45 FR 27710).

Other threats include hybridization with *G. elegans* (bonytail chub) and *G. robusta* (roundtail chub), introduced parasites, and effects of a species with a small population. Increased hybridization among the native *Gila* species is thought to be symptomatic of changes in habitat and movement patterns leading to the genetic introgression (UNHP 2003). The introduced Asian tapeworm may also be a serious threat to the survival of the humpback chub. Small population sizes magnify all threats, as small losses have a greater impact on long-term genetic diversity.

Occurrence in the Project Area

The humpback chub is endemic to the Colorado River basin and is primarily found in Utah. In the Project area, there are four known populations of humpback chub: Black Rocks, Westwater, Yampa, and Desolation/Gray Canyons. Some individuals have also been seen in the Green River through Dinosaur National Monument. Designated critical habitat for the species, in the Project area, includes portions of the Colorado, Green, and Yampa rivers. Water depletions within the upper Colorado River system in Wyoming, Colorado, and Utah could affect humpback chub or its habitat.

Least Chub (*Lotichthys phlegethontis*) – FWS: Candidate; BLM: Utah; State: Utah

Regulatory Status

In June 2007, the least chub was petitioned for listing under the ESA based on threats to habitat including: livestock grazing, mining; including peat mining and oil and gas leasing and exploration, urban development, and water withdrawal and diversion (73 FR 61007). FWS issued a 12-month finding on a petition to list the least chub in June of 2010, in which they found that listing of the least chub was warranted but precluded by higher priority actions (75 FR 35398). The least chub had been previously listed as a candidate species, but was removed from the candidate species list in October 1999 when the FWS found the least chub did not warrant listing under the ESA. Currently, only six known wild populations remain, but one of these is considered functionally extirpated. The species currently has a listing priority number of 7 (76 FR 66370–66439).

Taxonomy and Life History

The least chub is endemic to the Bonneville Basin of Utah. E.D. Cope first described the least chub from specimens collected by H.C. Yarrow and H.W. Henshaw from the Bear River in 1872 (60 FR 50518).

Adult least chubs can range from 0.2 to 2.5 inches and are identified by their upturned or oblique mouth as well as the absence of a lateral line. The least chub usually has eight dorsal fin rays and eight anal fin rays. Algae, midges, microcrustaceans, and algae are common diet items for the least chub.

Least chub begin spawning in the spring when water temperatures increase, releasing eggs over extended periods but only a few eggs at a time. Peak spawning occurs in May but the reproductive months are from April through August. The least chub's adhesive eggs are released over aquatic vegetation where they sink and attach. The fertilized eggs hatch and young larvae use that submerged vegetation as an oxygenated habitat with an abundance of food.

Distribution and Habitat Requirements

Once having a wide distribution within the Bonneville Basin of northwestern Utah, the least chub occupied streams, springs and ponds and was quite common in its preferred habitats. Least chub have been observed in the Beaver River, Provo River, tributaries of the Great Salt Lake and Sevier Lake as well as Utah Lake, Parowan Creek, Clear Creek, Leland Harris Spring Complex, and the Gandy Salt Marsh Complex in the Snake Valley.

The species is now limited to the Snake Valley of the Bonneville Basin, occurring on a mixture of federal, state, and private lands at five locations. Small populations of least chub exist in Central Spring (Bishop Spring Complex in Millard County) and Miller Spring (Juab County), Leland Harris Spring Complex (Juab County) and Gandy Salt Marsh Complex (Millard County), Snake Creek (60 FR 50518).

The least chub has historically occurred in a variety of habitat types but presently occupy springs, marshes and pools, and stream habitats. Springs exhibit cool stable temperatures, relatively low conductivity, and little variation in dissolved oxygen content. The marsh and pool environments exhibit extreme diurnal fluctuations in dissolved oxygen, and water temperature that may vary. Seasonal water quality changes in marsh and stream segments tend to influence fish movement between different habitat types. Plentiful aquatic vegetation along with muddy substrates is also an important habitat character for the least chub (Christ 1990).

Primary Threats to Survival

Habitat loss and degradation are one of the major causes of the least chub's decline. Reports of livestock trampling and grazing have been linked to fish habitat degradation in streams and springs (Christ 1990). Predation by nonnative fish is another known factor contributing to native desert fish declines in southwestern North America (Minckley et al. 1991). Spring complex surveys indicate that areas with nonnative fish introductions maintain few if any least chub populations. In addition to introductions of game fish, as least chub predators (largemouth bass, rainbow trout, common carp, and brook trout), other nonnative fish with similar diets are considered potential competitors (mosquitofish and rainwater killifish).

Occurrence in the Project Area

UDWR studies in 1990s and 2000s have monitored a least chub population in Burraston Ponds near Mona, approximately 1 mile from Links U640 and U650. This is the only known population in the vicinity of the Project area.

Least Tern (Interior Population; *Sternula antillarum*) – FWS: Endangered; State: Colorado

Regulatory Status

The least tern was listed as endangered on May 28, 1985, primarily due to river habitat loss and nesting site destruction from reservoir and channelization projects. Unfavorable vegetational succession for nesting on remaining river islands resulted from alteration of natural river dynamics (50 FR 21784). On September 19, 1990, a recovery plan was published with the objective of delisting the least tern in 2005 if the recovery criteria were met. Recovery criteria includes increasing or maintaining adult population in the Missouri River system, Lower Mississippi River, Arkansas River system, Red River system, and Rio Grande River system; and maintaining those stable population sizes for 10 years (FWS 1990c). A notice of initiation of a 5-year review of the listing of the least tern was published in March of 2008 that will be based on requested new information on the species (73 FR 21643).

Taxonomy and Life History

Subspecies of the least tern in North America were recognized as a result of studies on vocalization and behavior differences in the Old and New Worlds (AOU 1998). The interior least tern (*Sterna antillarum athalassos*), the eastern or coastal least tern (*Sterna antillarum antillarum*), and the California least tern (*Sterna antillarum browni*) were originally distinguished. Given reports of no consistent morphological, behavioral, or vocal difference between the California and the coastal least terns, and lack of morphometric or biochemical distinctions of the different subspecies, the FWS did not list the subspecies but instead designated those least terns occurring in interior North America as endangered (FWS 1990c).

The least tern is the smallest of the North American terns. In breeding seasons the adult plumage includes a black cap and lore stripe contrasting with a white forehead. The least tern is often most distinguishable from other terns in basic and subadult plumages by small size. Nest selection by the least tern is generally dependent on open areas free of vegetation, above high water levels and safe from ground predators. Islands are often preferred where they occur. Sandy areas with sparse vegetation, mudflats, graveled rooftops and parking lots, and dredged-material deposits are also used for nesting sites. Breeding time periods vary geographically. Early April on the Gulf Coast, later April in California, early May on the north Atlantic coast, and late April to late May are all feasible breeding times in the interior population. Typically clutches are two or three, sometimes one; three-egg clutches are more prevalent at interior breeding areas than coastal areas, with an incubation period generally between 19 and 25 days (Thompson et al. 1997).

The least tern primarily feeds on fish and aquatic invertebrates that occur in the upper portion of the water column. The species appears to select for fish, especially if non-deep-bodied fish are available. The least tern forages throughout the day searching for prey while flying or hovering above the water, quickly plunging to the surface, but not fully submerging when grasping aquatic prey. Occasionally, the species captures flying insects over land and water, or skims the water's surface to capture swimming insects (Wilson et al. 1993).

Distribution and Habitat Requirements

The least tern is a widely distributed breeder in North America. The species typically nests in open sandy beaches, sandbars, unvegetated islands, and a variety of material deposits along the coasts of oceans, bays, inland rivers, large lakes and reservoirs as well as Great Plains wetlands. In the coastal United States, the least tern breeds locally from southern Maine south to southern Florida, and along both shores of the Chesapeake Bay north to Baltimore and Queen Anne's, Maryland; as well as along the extreme southern Delaware Bay. The least tern also breeds locally along the Gulf Coast from southern Florida west to southern Texas and along the Pacific Coast from the San Francisco Bay south to the Mexican border.

Within the inland United States, the least tern breeds locally from Missouri, Ohio and Mississippi rivers west throughout the Great Plains to eastern Montana, eastern Colorado, and eastern New Mexico. The species also breeds in Colorado's Adobe Creek and Nee Noshe Reservoirs, Kiowa County, and Horse Creek Reservoir, Otero County. In S. Dakota: along Cheyenne River in Meade County, and in Nebraska: Platte River throughout from Lincoln County eastward, on Lake McConaughy of North Platte River, Loup River from Nance County to confluence with Platte, Elkhorn River throughout, and Niobrara River in Keyapaha. The least tern is also found in localized areas in the states: Nebraska, Kansas, Oklahoma, Texas, Arkansas, New Mexico, Louisiana, South Carolina, and Florida.

In Middle America, the least tern breeds in Mexico at coastal sites along Baja, the Pacific Coast from Sonora south to at least Oaxaca, along the Atlantic Coast in northern Tamaulipas, and along the northern

and eastern coast of the Yucatan Peninsula. They also breed in Belize and western Honduras (Thompson et al. 1997).

The least tern usually forms colonies on bare or sparsely vegetated sand or dried mudflats along coasts or rivers, and sandy islands as well as gravel and sand pits (Smith and Renken 1991). Colonies are typically near lagoons, estuaries, rivers, or coasts. Often nests are found on deposited dredged materials (Burger and Gochfeld 1990).

Least tern colony habitats can be ephemeral, which makes continued use difficult, but the species shows high colony site tenacity and fidelity that are both influenced by changes in vegetative cover, predators, human activity, flood, and colony size (Atwood and Massey 1988). The presence and number of suitable nest sites as well as human activity limit colony sites.

Primary Threats to Survival

Human activity causing least tern habitat alteration and destruction via channelization, irrigation, and the construction of reservoirs and pools have contributed to the elimination of much of this tern's sandbar and nesting habitat in the Missouri, Arkansas, and Red River systems (FWS 1990c). Most sandbars of the Missouri River have disappeared between Sioux City, Iowa, and Saint Louis. Habitat with sandbars often experience dam discharges, causing problems for the least terns nesting in remaining habitats. Before human regulation of river flows, summer flow patterns were more predictable with peak flows occurring in March and again in May and June with mountain snowmelt, allowing for flow decline during the rest of the summer and exposing sandbars during least tern nesting periods. Present hydropower, irrigation, and public recreation demands on river flow can conflict with historic flood regimes, often decreasing the quality and quantity of least tern nesting sites (FWS 1990c).

Occurrence in the Project Area

No least tern occurrences have been noted within or near the Project area based on Heritage data provided. According to FWS, the least tern does not occur west of Routt National Forest; however, the endangered interior populations may be affected by potential Platte River water use by the Project in Wyoming.

Mexican Spotted Owl (*Strix occidentalis lucida*) – FWS: Threatened; State: Colorado, Utah

Regulatory Status

The Mexican spotted owl was federally listed as a threatened species on March 16, 1993 (58 FR 14248). Critical habitat was originally designated on March 16, 1993 (58 FR 14248), and subsequently revoked on March 25, 1998 (63 FR 14378). Critical habitat was re-established on February 1, 2001 (66 FR 8530) and a comment period on critical habitat was re-opened on November 18, 2003 (68 FR 65020). The current defined critical habitat was established on August 31, 2004 (69 FR 53181). This apparent vacillation in designation of critical habitat is the result of conflict between environmental and economic interests in late seral stage coniferous forests inhabited by the bulk of northern spotted owls (*Strix occidentalis caurina*) in the Pacific Northwest. This conflict has resulted in several management plans and several FWS status reviews for the species (Gutierrez et al. 1995).

A recovery plan for the Mexican spotted owl was published in 2012. The recovery objective of the plan is to delist the species, which can occur when the population in the three most populated Recovery Units are stable or increasing, habitat monitoring protocols are designed and implemented, and a long-term management plan is in place to ensure appropriate management (FWS 2012e).

Taxonomy and Life History

The Mexican spotted owl is one of three recognized subspecies of the spotted owl in North America. *S. o. lucida* is the only subspecies that occurs in the Project study area. The other subspecies (*S. o. occidentalis* and *S. o. caurina*), the California spotted owl and the northern spotted owl, respectively, are found along the west coast from south-central California north to southwestern British Columbia (Gutierrez et al. 1995).

Spotted owls are usually found in steep canyons with mature or old growth forest, but they may also be found in canyons with steep cliffs and relatively little forest habitat. They usually occur in habitats that support a multi-leveled canopy with a perennial water source nearby. They have been reported at elevations ranging from 3,700 feet to the subalpine transition (Ganey 1998; Gutierrez et al. 1995; Johnsgard 1988).

Spotted owls are nocturnal ambush hunters that feed mainly on small mammals, primarily rodent species, with wood rats (*Neotoma* spp.) often the dominant dietary component. Invertebrates make up a small portion of their prey, and they may supplement their diet with birds, bats, or lagomorphs (Ehrlich et al. 1988; Ganey 1998; Gutierrez et al. 1995). In Arizona, Mexican spotted owls feed on wood rats, white-footed mice (*Peromyscus leucopus*), voles (*Microtus* spp.), rabbits, and pocket gophers (*Thomomys* spp.) (Ganey 1998).

Spotted owls may construct nests in tree cavities (usually in live trees) or on constructed platforms on tree limbs. In Utah they nest almost exclusively in caves (Gorell et al. 2005). They may use abandoned raptor or corvid platform nests (Ehrlich et al. 1988; Terres 1980). They produce from 2 to 4 eggs, with the typical number being two (Ehrlich et al. 1988; Gutierrez et al. 1995; Terres 1980).

Distribution and Habitat Requirements

The Mexican spotted owl is a permanent resident in the interior mountain ranges of western North America, from southern Utah and central Colorado south through the mountains of Arizona, New Mexico, and extreme west Texas. Its range in Mexico includes mountainous regions from Sonora, Chihuahua, Coahuila, and Nuevo Leon south to Jalisco, Michoacan, and Guanajuato (AOU 1998).

The Mexican spotted owl normally occupies old growth forest in mixed conifer, pine-oak woodland, deciduous riparian, or a combination of these habitats that will support a home range of 1,400 to 4,500 acres (Ehrlich et al. 1988; Gutierrez et al. 1995). An unaltered core area of approximately 600 acres centered on the nest site is the currently recommended disturbance buffer (Gutierrez et al. 1995). Habitat typically also has a structured canopy, a perennial water source, and a rodent dominated prey base of adequate size (Gutierrez et al. 1995).

Primary Threats to Survival

The primary threats to spotted owls are habitat destruction and fragmentation related to human activities, particularly timber harvest (Ehrlich et al. 1988; Gutierrez et al. 1995). Secondary human caused habitat impacts include losses associated with developments for urban or suburban expansion, and development for agriculture, reservoirs, mining, and fuel wood harvesting (Gutierrez et al. 1995).

Occurrence in the Project Area

There are several areas where the spotted owl could occur in the Project area in Utah: the northeast corner of Uintah County south of and including the Green River and its tributary canyons and the Desolation Canyon area of the Green River on the boundary between Carbon and Uintah counties (Gorell et al. 2005;

Utah Department of Natural Resources 2008). The Mexican spotted owl is not believed to occur in Colorado or Wyoming. The Project does not cross designated critical habitat for the species.

Pallid Sturgeon (*Scaphirhynchus albus*) – FWS: Endangered

Regulatory Status

The pallid sturgeon was originally submitted as a category 2 candidate species on December 30, 1982 (47 FR 58454–58460). The species was listed as endangered on September 6, 1990 (55 FR 36641–36647). On November 7, 1993, a recovery plan for the pallid sturgeon was published. The objective of this plan is to delist the species by 2040. Delisting may be considered when a population structure with at least 10 percent sexually mature females in each recovery-priority management area and there are sufficient population numbers in the wild to maintain stability. Specific numbers quantifying “sufficient population numbers” has yet to be determined (Dryer and Sandvol 1993; FWS 2007c). No critical habitat has been designated for the pallid sturgeon.

Taxonomy and Life History

The pallid sturgeon is a member of an ancient group of bony fishes (subclass *Paleopterygii*) that thrived from the Paleozoic Era through to the early Mesozoic Era. Most species in this subclass went extinct, but eight species of sturgeon (family *Acipenseridae*) and the paddlefish (family *Polyodontidae*) continue to inhabit portions of North America (Dryer and Sandvol 1993).

The pallid sturgeon was described in 1905 from nine specimens collected out of the Mississippi River near Grafton, Illinois. It was originally classified as its own genus (*Paracaphirhynchus*), but was ultimately determined to be part of the genus *Scaphirhynchus* in 1954 (Dryer and Sandvol 1993).

The pallid sturgeon is long and slender with a completely armored caudal peduncle. It has a flattened, shovel-shaped snout with a toothless mouth located on the ventral side of the snout. The species is the largest fish species found in the Missouri/Mississippi River drainage with some individuals near 86 pounds. Individuals found in the northern portions of the species’ ranges tend to be significantly larger than those in the southern portions of the range (Dryer and Sandvol 1993).

Spawning occurs between June and August. It is unclear at what size and age sexual maturity is reached, but for most sturgeon species, sexual maturity is not reached until 7 years of age and several years for eggs to mature between spawnings is required. One study estimates that male pallid sturgeons reach sexual maturity at 7 to 9 years with 2- to 3- year intervals between spawning years. Females were estimated to reach sexual maturity at 15 to 20 years with 3- to 10-year intervals between spawning years (Dryer and Sandvol 1993).

Pallid sturgeons primarily consume fish, but will also consume aquatic invertebrates (Dryer and Sandvol 1993).

Distribution and Habitat Requirements

Pallid sturgeons inhabit the Missouri and Mississippi River systems from Montana to southern Louisiana in addition to tributaries of those rivers. The pallid sturgeon evolved with the rivers and relied on the annual floods that would occur as a result of snowmelt. These flood events would occur in April and June stimulating spawning migrations (Dryer and Sandvol 1993).

Specific habitat preference data is extremely limited due to the rarity of the species. Utilizing capture occurrences may or may not provide a true representation of the micro-habitat characteristics of the pallid sturgeon. Pallid sturgeons are often captured over a sand bottom which is the predominant bottom

substrate within the species' range. The species has been captured over gravel and rock in the Yellowstone River. The species is most often captured in areas with a velocity of 1.3 to 2.9 feet per second or in slower currents near to shore (Dryer and Sandvol 1993).

Primary Threats to Survival

The primary threat to the survival of the pallid sturgeon is habitat loss. Destruction and alteration of the river system by humans through dams and channelization has greatly altered the water flow and ecosystems of these rivers. Channelization results in changes in water velocity, reduces the width of the river, and prevents water flow into backwaters. Dams have resulted in the control of annual flooding as well as fragmenting habitat. Impoundments have also reduced the sediment. Pallid sturgeons evolved to live in a nearly sightless world. Water clarity has increased predation by sight-feeding predators as well as making capture of prey by pallid sturgeons more difficult (Dryer and Sandvol 1993).

Occurrence in the Project Area

There are no occurrences of pallid sturgeon with or near the Project area. However, the species does inhabit the lower Platte River. The lower Platte River is considered to be the Platte River from the confluence with the Missouri River upstream to the Loup River (FWS 2007c). This area is entirely located in eastern Nebraska, but may be affected due to drawdown should the Project use water from the Platte River in Wyoming.

Piping Plover (*Charadrius melodus circumcinctus*) – FWS: Threatened; State: Colorado

Regulatory Status

All regulatory designations for piping plover have been at the species level. On December 30, 1982, the FWS designated the piping plover as a category 2 candidate for listing (47 FR 58458). On December 11, 1984, the Great Lakes breeding population was designated as endangered and all other piping plovers were designated as threatened (50 FR 50726–50734). The Great Lakes breeding population includes the states of Illinois, Indiana, Mississippi, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin, and the province of Ontario.

Critical habitat for the Great Lakes breeding population was designated on May 7, 2001 (66 FR 22938–22969). Critical habitat for wintering piping plovers was designated on July 10, 2001 (66 FR 36038–36143). Critical was designated for the Northern Great Plains breeding population on September 11, 2002 (67 FR 57638–57717).

Recovery plans have been developed for each of three separate breeding populations: Atlantic Coast, Great Lakes, and Northern Great Plains. These plans call for recovery criteria specific to each population (FWS 2009b).

Taxonomy and Life History

Two subspecies of piping plover (*Charadrius melodus circumcinctus* and *C.m. melodus*) have been recognized since 1957. The subspecies *melodus* is considered the Atlantic coast subspecies and *circumcinctus* is the inland subspecies. There has been debate over the recognition of these subspecies; however, recent genetic analysis has come to suggest that subspecific differentiation is valid and that Great Lakes birds align more closely with the inland birds than the Atlantic birds (Elliott-Smith and Haig 2005; FWS 2009b). Even though the Great Lakes and Northern Great Plains populations are a single subspecies, behavioral and ecological factors provide enough separation to continue managing these two populations separately (FWS 2009b).

Piping plovers are small shorebirds with a brown dorsal side and white underbelly. They have a ring around their neck that may be complete or incomplete. Plovers have stubby bills with an orange base and black tip (Elliott-Smith and Haig 2005).

Piping plovers tend to lay four eggs per clutch and have one brood per year. Females may lay multiple clutches if nests are destroyed, but will only raise a single brood. Nests are dug in sandy substrate. In the northern reaches of the breeding range, the species will begin laying eggs during the first 2 weeks of May and incubate for 25-28 days. Chicks fledge between 21 and 35 days of age (Elliott-Smith and Haig 2005).

Piping plovers forage along freshwater and marine shorelines. They feed on freshwater, marine, terrestrial, and benthic invertebrates (Elliott-Smith and Haig 2005).

Distribution and Habitat Requirements

As previously mentioned, there are three breeding populations. The Atlantic Coast population inhabits the Atlantic Coast between Newfoundland and North Carolina. The northern Great Plains breeding populations ranges from northern Saskatchewan and south to portions of Kansas and Oklahoma and from Montana east to Minnesota. The Great Lakes population was found throughout much of north-central United States and south-central Canada, but is currently limited to northern Michigan and northern Wisconsin. Piping plovers winter along the Atlantic and Gulf Coasts from North Carolina to Mexico and portions of the West Indies and Bahamas (66 FR 22939).

Breeding habitat consists of open sandy beaches. These beaches may be found on shorelines of oceans or Great Lakes, but may also be found along alkali lakes, reservoirs, rivers, freshwater lakes, dry alkali lakes, sandpits, industrial ponds, and gravel mines. The species tends to prefer wide, sparsely vegetated sand or gravel beaches adjacent to vast waters. Along rivers, piping plovers will use beaches, sand flats, dredge islands, and drained floodplains where vegetative cover is less than 20 percent. Winter habitat is similar to breeding habitat, but is almost entirely located along oceanic coasts and bays (Elliott-Smith and Haig 2005).

Primary Threats to Survival

The primary threat to piping plovers is loss of habitat. Shoreline development along the Gulf and Atlantic Coasts and along the Great Lakes has greatly reduced the amount of available habitat. Additional efforts to stabilize beaches in the wake of large storms have altered the natural tidal flows in many areas. In the northern Great Plains population area, development of reservoirs, channelization of rivers, and modification of river flows have greatly altered the vegetation growth in areas that were previously scoured of vegetation by spring flooding events (FWS 2009b)

In addition to these threats, other human-related impacts are threatening the survival of piping plovers. Recreation along coasts and shorelines disturb roosting and/or nesting plovers. Pets often destroy nests. Wind and oil development throughout much of the species' range may further impact survival (FWS 2009b)

Occurrence in the Project Area

There are no piping plovers or habitat in the Project area. However, the species is known to inhabit the Platte River throughout Nebraska. There may be potential for impact to the species through project-related water use resulting in drawdown of water downstream in the Platte River.

Razorback Sucker (*Xyrauchen texanus*) – FWS: Endangered; State: Colorado, Utah**Regulatory Status**

The razorback sucker was first proposed for listing as a threatened species under the ESA of 1973 on April 24, 1978 (43 FR 17375). On May 27, 1980, the FWS withdrew the proposal, because it was not finalized within the 2-year time limit from the initial publication in the *Federal Register* (45 FR 35410). In 1989, the FWS received a petition from the Sierra Club, National Audubon Society, The Wilderness Society, Colorado Environmental Coalition, Southern Utah Wilderness Alliance, and the Northwest Rivers Alliance requesting that the razorback sucker be listed as an endangered species. A positive finding was made and subsequently published by the FWS on October 23, 1991 (56 FR 54957). On March 21, 1994 the FWS designated 15 reaches of the Colorado River system, including portions of the Green, Yampa, Duchesne, Colorado, White, Gunnison, and San Juan rivers in the Upper Basin and portions of the Colorado, Gila, Salt, and Verde rivers in the Lower Basin, totaling 1,724 miles of critical habitat for the species (59 FR 13374). On February 14, 2007, the FWS and Nevada Department of Wildlife entered into a Safe Harbor Agreement, encouraging the conservation, enhancement of survival, and recovery of the species through development of facilities for the rearing of juveniles and providing refuge habitats for adult razorback suckers (71 FR 57558). A 5-year review was initiated on April 18, 2007 (72 FR 19549).

The current recovery plan for the razorback sucker was published in 1998 and amended in 2002. To address unique threats and site-specific management actions, the entire population of the razorback sucker has been reduced to upper and lower basin recovery units. The upper basin recovery subunit is composed of the Green River, upper Colorado River, and San Juan River subbasins and the lower basin recovery subunit includes the mainstem and tributaries of the Colorado River from Lake Mead downstream to the southerly International Boundary with Mexico. The species may be downlisted from endangered to threatened, if during a 5-year period: (1) two subbasins (one Green River subbasin and one in either the Colorado River or San Juan River subbasins) and two subunits (lower basin recovery subunit) demonstrate that genetically and demographically viable, self-sustaining populations of more than 5,800 adults are maintained; (2) a genetic refuge is maintained in a suitable location in the lower basin recovery unit such as Lake Mohave; and (3) site-specific management tasks to minimize or remove threats have been identified, developed and implemented. Delisting can occur if the three goals listed above are maintained for an additional 3 years past downlisting and a necessary level of protection is attained (FWS 2002b).

Taxonomy and Life History

The razorback sucker, also known as the humpback sucker, is a member of the family *Catostomidae*. The razorback sucker was first described by Charles Conrad Abbott as *Catostomus texanus* because it was mistakenly thought that the species had come from the Colorado River in Texas. In 1889 it was reorganized into the *Xyrauchen* genus, which translates to “razornape”. LaRivers redescribed the species, correctly identifying the place of origin to the Colorado and New rivers in Arizona (FWS 2002b).

Adult razorback suckers can grow up to 3 feet long and weigh up to 13 pounds. However, most specimens are smaller. The largest razorback suckers currently inhabit the warmer climates of the lower Colorado River. It is easily distinguished from other catostomids by a pronounced bony keel that grows from the dorsal surface of its back and gill rakers, an adaptation for feeding on zooplankton. Razorback suckers consume insects, zooplankton, phytoplankton, algae, and detritus, depending on age and habitat. Larvae begin feeding on plankton, as the mouth migrates to a sub-terminal position, larvae begin feeding on benthos as well (FWS 2002b).

Razorback suckers spawn as early as 3 to 4 years of age. Depending on water temperature, spawning may begin in mid-April and last as late as June. In Lake Mohave, spawning has been observed as early as

November, but no earlier than February in Lake Mead. They migrate long distances, congregating in large numbers at spawning sites. Razorback suckers are broadcast spawners that deposit adhesive eggs over a cobble substrate that are quickly covered by silt. Adults do not guard nests (FWS 2002b).

Distribution and Habitat Requirements

Historically, the razorback sucker was widely distributed and abundant in the Colorado River and major tributaries from Northern Mexico through Arizona and Utah into Wyoming, Colorado, and New Mexico. Now it is much reduced in range and abundance. In the Lower Colorado Basin numbers of razorback sucker began to decline with the impoundment of Lake Mead.

In the Upper Colorado River Basin, razorback suckers are considered extant in 4 locations: Westwater and Cataract Canyons and the Utah-Colorado border on the Colorado River, Desolation/Gray Canyons of the Green River, and a population in northeastern Colorado on the Yampa River. The razorback sucker is more widely distributed in the Lower Basin. The total population is estimated at approximately 10,500 individuals in three areas. The Lake Mohave population is the largest, estimated at 9,000 individuals. There is no observed recruitment in the population though, so as the population ages it becomes smaller. In Lake Mead, the population is estimated at about 400 individuals with an average age of 20 to 25 years of age, indicating recent recruitment. Approximately 1,000 individuals are believed to inhabit a 60-mile reach between Davis Dam and Lake Havasu and have demonstrated reproduction (FWS 2002b).

Razorback sucker habitat includes slow areas, backwaters, and medium to large eddies of medium to large rivers and their impoundments. Three of the four remaining populations of more than 100 individuals are found in reservoirs. Flooded lowlands and lower portions of tributary streams serve as resting and feeding areas during breeding season in the Green River basin. The razorback sucker is commonly associated with sandy, muddy, and rocky substrates in areas with little aquatic vegetation. In Lake Mohave, individuals were associated with inshore habitats except during the hotter months when they moved offshore possibly to avoid warmer water temperatures (FWS 2002b).

In streams, spawning occurs most commonly near shores in streams over silty sand, gravel, or rock substrate. In reservoirs, spawning occurs on gravel bars swept clean by wave action or along shorelines over mixed substrates. Larvae appear to remain in gravel until swim-up in the shallow littoral zone for a few weeks after hatching, and then disperse to deeper waters. Seasonally inundated flood plains provide favorable feeding areas for young (FWS 2002b).

Primary Threats to Survival

Primary threats to the razorback sucker are non-native fishes and invertebrates and human alteration of riparian habitat. Predation on larvae and juveniles by introduced fishes results in low and sometimes absent recruitment despite confirmed spawning and hatched larvae. Competition with and predation by exotic crayfish may have also been documented in some areas. Hybridization with other suckers is a potential problem in some locations. The loss, fragmentation, and modification of habitat due to construction and operation of dams greatly restrict the amount of suitable habitat. Dams lead to impoundment of streams causing changes in winter and spring flows, altered river temperatures, and reduced flooding (FWS 2002b).

Occurrence in the Project Area

The razorback sucker is endemic to the Colorado River Basin, found primarily in Utah. In the Project area, the razorback sucker is found in Westwater and Cataract Canyons on the Colorado River in Grand, San Juan, and Wayne counties, Desolation/Gray Canyons on the Green River in Carbon, Emery, and Grand counties, and in the Yampa River in Moffat County, Colorado. Portions of the designated critical

habitat are also in the Project area in the Green, Yampa, Duchesne, Colorado, White, and Gunnison rivers. Water depletions within the upper Colorado River system in Wyoming, Colorado, and Utah could affect razorback sucker or its habitat.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*) – FWS: Endangered; State: Colorado, Utah

Regulatory Status

The southwestern willow flycatcher was listed as endangered on February 27, 1995, primarily because of loss and modification of riparian habitats (60 FR 10695–10715). Critical habitat was later designated on July 22, 1997 (62 FR 39129). A court decision in 2001 resulted in a subsequent final rule on critical habitat on October 19, 2005 (70 FR 60885). It includes a portion of the Virgin River in Washington County, Utah, and Clark County, Nevada. A 5-year review of the species was completed by the FWS in 2005 (73 FR 14995).

A recovery plan for the southwestern willow flycatcher was published in 2002. Reclassification status includes increasing the total population to 1,950 geographically distributed territories, which must be maintained for 5 years before delisting can occur (FWS 2002e).

Taxonomy and Life History

The southwestern willow flycatcher was originally described by John James Audubon in 1828 as Traill's Flycatcher (*Muscicapa traillii*), from specimens obtained in wooded areas along the Arkansas River (Sedgwick 2000). Phillips (1948) described *E. t. extimus*, the southwestern willow flycatcher, from specimens collected on the San Pedro River in southeastern Arizona. Depending on the author, there are four or five recognized subspecies of the willow flycatcher; *E. t. traillii*, *E. t. adastus*, *E. t. brewsteri*, *E. t. extimus*, and *E. t. campestris (the outlier)* (Sedgwick 2000).

Southwestern willow flycatchers normally select nest sites in thickets of shrubs and trees between 4 and 7 meters (4 to 23 feet) in height, with dense foliage between ground level and 4 meters (13 feet) (60 FR 10695–10715; Ehrlich et al. 1988). The nest is an open, compact cup of plant bark, fiber, and grass, and it is lined with a thin layer of fine grass, and cottony and silky plant materials. There are frequently feathers in the rim, and the nest may have plant material dangling from the bottom (Harrison 1979). Nest trees are often rooted in or near water. Plant species diversity in nest territories varies. The southwestern willow flycatcher will nest in native riparian species where available, but it will also nest in monocultures of salt cedar (*Tamarix* sp.) or Russian olive (*Elaeagnus angustifolia*) (USGS 2008). Nest sites are commonly reported in Geyer willow (*Salix geyeriana*), Goodding willow (*S. gooddingii*), boxelder (*Acer negundo*), and live oak (*Quercus agrifolia*) (Sogge et al. 1997). Southwestern willow flycatchers usually spend only 3 to 4 months on their breeding grounds, spending the rest of the year in migration or at wintering grounds (FWS 2002e). Females lay a clutch of 3 to 4 eggs (FWS 2002e). Nestlings fledge after 12 to 15 days (Ehrlich et al. 1988; FWS 2002e).

Like most other flycatchers, the willow flycatcher forages primarily by flying from a perch to capture flying insects (Ehrlich et al. 1988). It also will use gleaning techniques when foraging for spiders, millipedes, and other flightless arthropods, and also when feeding on berries (Sedgwick 2000; Terres 1980). Food preferences of the willow flycatcher are reported by Bent (1942), in documentation associated with the Alder flycatcher. These were considered a single species at the time the data were collected, and the sample set included both species. In the sampled diets, animal material made up 96 percent, and vegetative material was only 4 percent of the food. The vegetative part of the diet included elderberries (*Sambucus* spp.), blackberries or raspberries (*Rubus* spp.), dogwood berries (*Cornus* spp.), juniper berries (*Juniperus* spp.), and unidentified fruits and seeds.

Distribution and Habitat Requirements

All subspecies of the willow flycatcher winter in Central America, from southwestern Mexico (Nayarit and Oaxaca) south to Panama and possibly northwestern Columbia (AOU 1998), but migration routes are relatively unknown (FWS 2002e) and are believed to pass through primarily the southern and southwestern parts of the United States, with the northern subspecies passing through the breeding areas of the southwestern willow flycatcher (AOU 1998; Sogge et al. 1997). The normal spring migration period is from early May through early June, and the fall migration may extend from late July through September (Phillips et al. 1964). Historic breeding records exist for southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, southwestern Colorado, and northwestern Mexico (FWS 2002e). In the western United States, southwestern willow flycatchers are often found on willow-covered islands, brush along watercourses, beaver meadows, and mountain parks, always in close association with riparian waters and lentic waters (FWS 2002e). They may be found as high as 7,875 feet, and they also follow willow- or cottonwood-lined streams out into desert regions (Terres 1980).

Southwestern willow flycatcher territories and nest sites are usually located near open water, cienegas, marshy seeps, or saturated soils (Sogge et al. 1997). In the semiarid and arid parts of the southwest, hydrologic conditions can vary radically both within a season and between years. Many sites have surface water or saturated soil only during the early part of the breeding season. Breeding habitat on the edge of a reservoir may have standing water during a wet year, or it may be further from surface water during dry conditions (Sogge et al. 1997).

Four specific habitat types have been described as breeding areas for the southwestern willow flycatcher (Sogge et al. 1997). The first of these types is monotypic high-elevation willow. This habitat is comprised of dense stands of willows 3 to 7 meters (10 to 23 feet) in height, with no distinct overstory. This community is often associated with sedges, rushes, or other herbaceous wetland plants. A second habitat type is monotypic exotic, with dense stands of salt cedar or Russian olive up to 10 meters (33 feet) in height. These species form a dense, closed canopy, with no distinct overstory layer (Sogge et al. 1997).

Native broadleaf-dominated communities form a third habitat type. This habitat may be composed of a single species, such as Goodding willow, but often contains other broadleaf tree and shrub species, including cottonwood (*Populus* spp.), other willows, boxelder ash (*Fraxinus* spp.), alder (*Alnus* spp.), and buttonbush (*Cephalanthus occidentalis*). The vegetation in this habitat type ranges in height from 3 to 15 meters (10 to 49 feet). There are trees of various size classes, and there is often a distinct overstory. The final habitat type is a mixture of native and exotic species, including those listed above. Within any particular area, the native and exotic species may be dispersed as patches dominated by natives or exotics, or they may be more evenly distributed throughout the area (Sogge et al. 1997).

Regardless of the species composition, all of these habitats share common structural characteristics. Occupied habitats always have dense vegetation in the patch interior, and dense patches are often interspersed with small clearings, open water, or areas of sparse shrubs. Habitat patches can vary in size and shape, with some occupied areas being relatively dense, linear, contiguous stands, and others being large, irregularly shaped mosaics of dense vegetation intermingled with open areas. Patch sizes can range from as little as 2 acres to several hundred hectares (several hundred to a thousand acres). Southwestern willow flycatchers have not been found nesting in narrow riparian habitats less than 10 meters (33 feet) wide (Sogge et al. 1997).

Migration and wintering habitat may differ from breeding habitat. During migration, riparian habitat along major southwestern drainages is commonly used, but a close association with water may not always exist. These areas might be considered stopover areas, and may be very important resources for the southwestern willow flycatcher (FWS 2002e).

Primary Threats to Survival

Two primary factors have been identified as serious threats to the continued existence of the southwestern willow flycatcher (60 FR 10695–10715). These threats are the loss and degradation of riparian habitat, and brood parasitism by brown-headed cowbirds (*Molothrus ater*). The primary causes for riparian alteration and degradation include urban and agricultural development, water diversion and impoundment, channelization, livestock grazing, off-road vehicles and other recreational use, and hydrological changes resulting from these uses (Jones and Cahlan 1975) (60 FR 10695–10715).

The FWS believes that the invasion of salt cedar is a factor in the loss and modification of habitat for the southwestern willow flycatcher (60 FR 10695–10715). Many other human activities, including livestock grazing, water diversion, channelization, and vegetation removal, in the riparian area tend to favor the spread of salt cedar. The spread of salt cedar coincides with the decline of the southwestern willow flycatcher, although the flycatchers have been documented to breed in dense salt cedar stands (60 FR 10695–10715).

Brown-headed cowbirds also are a threat to southwestern willow flycatchers because of their reproductive strategy of brood parasitism. The spread of cowbirds into the range of the southwestern willow flycatcher began in the late 1800s, with the increase in the human-population density and their associated livestock (60 FR 10695–10715). The willow flycatcher is a common host to cowbirds (Ehrlich et al. 1992; Sogge et al. 1997). The flycatchers appear to be nearly incapable of rearing their own young if a cowbird chick is in the nest, and parasitism almost always leads to a complete failure of the nest (Sogge et al. 1997).

Occurrence in the Project Area

Portions of the Project area in Utah are within the breeding range of the southwestern willow flycatcher (Sedgwick 2000). However, the Project area does not include any designated critical habitat for the species. Southwestern willow flycatchers may be present within riparian habitats in Grand and Emery counties, Utah.

Whooping Crane (*Grus americana*) – FWS: Endangered; State: Colorado

Regulatory Status

The whooping crane was listed as endangered on March 11, 1967 (32 FR 4001). Currently, any populations occurring in Colorado, Idaho, Florida, New Mexico, Utah, the western half of Wyoming, or specifically named eastern states of the contiguous United States are considered nonessential experimental populations (66 FR 33903–33917, 62 FR 38932–38939, 58 FR 5647–5658). Critical habitat was designated in the United States in 1978 for key wintering and migration areas (43 FR 20938–20942).

Taxonomy and Life History

The whooping crane is a member of the family *Gruidae*, its closest relatives in continental North America being five races of sandhill cranes (*Grus canadensis*). The whooping crane is North America's tallest bird, with males approaching 5 feet (1.5 meters) in height. The sexes appear the same, although their guard call vocalizations are sexually distinct. The plumage is snowy white, with black primaries, a carmine crown and malar region, and a dark wedge-shaped patch on the nape. Juvenile birds have reddish-cinnamon plumage until the end of their second summer.

Eggs are normally laid from late April to mid-May, and hatch a month later. Whooping cranes generally nest annually, unless nesting habitat conditions are unsuitable or the birds are nutritionally stressed. The diet varies seasonally and by habitat, but includes insects, frogs, rodents, fish, plant tubers, berries, crabs, crayfish, clams, and agricultural grains (Canadian Wildlife Service and FWS 2007).

Distribution and Habitat Requirements

Historically, whooping cranes ranged from the Arctic coast south the central Mexico, and from Utah east to New Jersey, South Carolina, Georgia, and Florida (Canadian Wildlife Service and FWS 2007). Currently, only three wild populations exist, with another nine in captivity at various facilities. As of February 2006, the total wild population consisted of 338 individuals, and the total captive population of 135 individuals (Canadian Wildlife Service and FWS 2007).

The Aransas-Wood Buffalo population nests in and around Wood Buffalo National Park in Alberta and the Northwest Territories, and winters in and adjacent to Aransas National Wildlife Refuge on the Texas coast. Departure from the wintering grounds generally begins between March 25 and April 15, with the autumn migration commencing around mid-September. Most birds will have arrived on the wintering grounds between late October and mid-November (Canadian Wildlife Service and FWS 2007).

Reintroduction attempts in the Rocky Mountains took place from 1975 to 1989 and again in 1997. One male from that population remains in captivity; the last remaining wild bird died in 2002 (Canadian Wildlife Service and FWS 2007). A non-migratory flock was introduced in the Kissimmee Prairie and surrounding area in central Florida in 1993. Efforts have been ongoing since 2001 to establish a migratory flock between Wisconsin and the central Florida Gulf Coast.

Breeding habitat within Wood Buffalo National Park (Canada) consists of numerous shallow, poorly drained wetlands of varying sizes and shapes, separated by narrow, slightly elevated ridges with an overstory of white and black spruce (*Picea glauca*, and *P. mariana*), tamarack (*Larix laricina*), and willows (*Salix* spp.), with a shrub understory. Habitat on the wintering grounds includes tidal flats, estuarine marshes, and other shallow coastal wetland communities (Lewis 1995).

Primary Threats to Survival

A variety of factors threaten the survival of the whooping crane. As with many other endangered species, destruction of habitat, loss of migration stopover habitat, and displacement due to human activities are threats. Additionally, loss of individuals by human shooting remains a threat. As recently as November 2009, a reproductive female whooping crane from the Wisconsin/Florida migratory population was shot and killed in Indiana (FWS 2009c). An estimated 60 to 80 percent of crane losses occur during migration, with the primary cause of loss being collisions with utility lines. Additional threats are posed by disease, inclement weather, predation, and the species' delayed reproductive maturity, low reproductive rates, and drastically reduced gene pool (Canadian Wildlife Service and FWS 2007; Lewis 1995).

Occurrence in the Project Area

The Aransas-Wood Buffalo population of whooping cranes migrates across the Great Plains twice a year, between the Texas Gulf Coast and northern Alberta/southern Northwest territories in Canada. The vast majority of whooping crane sightings for this migration route fall within a narrow corridor crossing Texas, Oklahoma, Kansas, Nebraska, South Dakota, North Dakota, Saskatchewan, Alberta, and the Northwest territories (FWS 2009d; Stehn 2007). The introduced Rocky Mountain population included wintering grounds in eastern Idaho and western Wyoming, however no individuals of that population remain in the wild (Canadian Wildlife Service and FWS 2007); therefore, no whooping cranes would be expected to occur within the Project study area. Whooping crane and designated critical habitat along the Platte River could be affected by water use in the Platte River system.

Yellow-billed Cuckoo (*Coccyzus americanus*) – FWS: Proposed Threatened; BLM: Wyoming, Colorado, Utah; USFS: Ashley, Manti-La Sal, Uinta National Forests; State: Wyoming, Colorado, Utah

Regulatory Status

FWS proposed listing the yellow-billed cuckoo of the western United States DPS as a threatened species under the ESA of 1973, as amended (78 FR 61622-61665). The DPS was previously a candidate for listing as threatened or endangered (66 FR 54808–54832). Yellow-billed cuckoo has not been assigned federal status east of the Continental Divide but is considered a sensitive species by federal and state agencies in the western region.

Taxonomy and Life History

The yellow-billed cuckoo is one of six species of the family *Cuculidae* that breed in the United States (National Geographic Society 2002). The yellow-billed cuckoo was first described by Linnaeus in 1758 as *Cuculus americanus*, with the western yellow-billed cuckoo being described in 1887 as *Coccyzus americanus occidentalis* by Ridgeway. However, since the late 1800s, debate has centered on whether the species should be split into eastern (*C. a. americanus*) and western (*C. a. occidentalis*) subspecies (66 FR 38611–38626). Those in favor of recognizing subspecies cited differences in morphology between eastern and western birds. Review and study of yellow-billed cuckoo taxonomy occurred in response to a petition in 1986 to list the yellow-billed cuckoo as endangered in California, Washington, Oregon, Idaho, and Nevada. In their response to a second petition the FWS determined that there was not enough evidence to consider the western population as a distinct subspecies, but the population did warrant listing as a DPS. The range of the western yellow-billed cuckoo was determined to be the area west of the west of the Rocky Mountains (66 FR 38611–38626).

Western populations of yellow-billed cuckoos breed in dense riparian woodlands, primarily of cottonwood (*Populus fremontii*), willow (*Salix* spp.), and mesquite (*Prosopis* spp.), along riparian corridors in otherwise arid areas (Hughes 1999). Dense undergrowth may be an important factor in selection of nest sites (Ehrlich et al. 1988). Western yellow-billed cuckoos appear to require relatively large tracts of riparian woodland. Several studies have reported western yellow-billed cuckoos nesting in tracts greater than 25 acres in size. These cuckoos may be restricted to areas close to water because of humidity requirements for hatching eggs and rearing chicks (Laymon 1998).

Most western yellow-billed cuckoos arrive on their breeding grounds in June (Laymon 1998). They construct an unkempt stick nest on a horizontal limb, often in shrubby vegetation (Ehrlich et al. 1988; Terres 1980). Nest heights range from 4.3 feet to (rarely) 98 feet and average below 20 feet (Laymon 1998).

Yellow-billed cuckoos lay one to five large eggs, which hatch after 9 to 11 days of incubation (Ehrlich et al. 1988). Nestlings fledge at 5 to 8 days of age, giving the species the shortest combined incubation/nestling period known for any bird (Corman and Wise-Gervais 2005; Hughes 1999). They are occasionally brood parasites of other species (Hughes 1999). This behavior may be stimulated by high egg production resulting from abundant food supplies (Ehrlich et al. 1988).

Yellow-billed cuckoos forage primarily by gleaning insects from vegetation, but they may also capture flying insects (Ehrlich et al. 1988; Hughes 1999; Laymon 1998). They specialize on relatively large prey, including caterpillars, katydids, cicadas, grasshoppers, and tree frogs (Laymon 1998; Terres 1980). Their breeding season may be timed to coincide with outbreaks of insect species, particularly tent caterpillars (Hughes 1999; Ehrlich et al. 1988; 66 FR 38611–38626). They also consume some wild berries; take small lizards and frogs, and occasionally bird eggs and young as prey (Hughes 1999; Terres 1980).

Distribution and Habitat Requirements

The western yellow-billed cuckoo was formerly widespread and locally common in California and Arizona; locally common in New Mexico, Oregon, and Washington; and local and uncommon along drainages in western Colorado, western Wyoming, Idaho, Nevada, and Utah (66 FR 38611–38626). Populations of yellow-billed cuckoos in the western United States have declined over the past century and their breeding range has contracted. The species may be extirpated from British Columbia, Washington, and Oregon (Hughes 1999).

The yellow-billed cuckoo breeds from interior California, southern Idaho, the Dakotas, and southern New Brunswick south to Baja California, southern Arizona, Chihuahua, the Gulf Coast and the Greater Antilles. The breeding range formerly extended north to western Washington (AOU 1998). Although an uncommon summer resident in Wyoming, it has not been confirmed as breeding in the area (Cervinski et al. 2004). Breeding records are very rare and the species only occurs in scattered drainages in western Colorado, Idaho, Nevada, and Utah (NatureServe 2008c). Breeding records in Utah are rare in lowland riparian habitats. Records exist in the northern Salt Lake Valley (Weber and Salt Lake counties), Utah Lake near the mouth of the Provo River (Utah County), Cedar City, and Beaver Dam Wash (Washington County). Extensive riparian habitat occurs at the confluence of the Duchesne, White, and Green rivers on the Uintah and Ouray Reservation (Grand and Uintah counties) (Bosworth 2003; Parrish et al. 2002), and sustains the largest breeding population of yellow-billed cuckoo in Utah (BLM 2008d).

The western yellow-billed cuckoo prefers large stands of mature, dense willows, typically associated with riparian corridors, for nesting, but also prefers a multi-storied canopy and dense shrubby vegetation that provides adequate invertebrate prey and cover for foraging juveniles (Corman and Wise-Gervais 2005). Water is required near the nesting site (Corman and Wise-Gervais 2005; Floyd et al. 2007). Dense vegetation may also be important in maintaining humidity in the nesting area (Corman and Wise-Gervais 2005).

Primary Threats to Survival

The primary threat to western yellow-billed cuckoos is the loss of high quality riparian habitat suitable for nesting (Corman and Wise-Gervais 2005; Floyd et al. 2007). Riparian habitat throughout the western United States has been modified or destroyed by dams, water diversions, riverflow management, stream channelization and stabilization, conversion to agricultural uses (e.g., livestock grazing), construction of urban and transportation infrastructure, and an increased incidence of wildfire. Habitat fragmentation and invasion of native habitats by nonnative plant species (especially tamarisk) result from the aforementioned habitat modifying factors (78 FR 61622-61665). The increasingly fragmented yellow-billed cuckoo habitat landscape resulting from this level of habitat loss and modification can decrease breeding success due to barriers to disappearing juvenile and adult birds, increase predation rates, and decrease local yellow-billed cuckoo abundances (78 FR 61622-61665).

Other natural and manmade factors threatening the continued existence of yellow-billed cuckoo include habitat rarity, small overall population size, isolation of populations, lack of immigration, chance weather events, fluctuating availability of prey populations, pesticides, collisions with tall vertical structures during migration, spread of the introduced tamarisk leaf beetle as a biocontrol agent in the Southwest that results in defoliation of non-native habitats used for nesting, and climate change (78 FR 61622-61665).

Occurrence in the Project Area

The western yellow-billed cuckoo may occur in riparian habitats associated with major river systems in the Project area. The species has been observed in the vicinity of Flaming Gorge (Sweetwater County, Wyoming) (Cervinski et al. 2004). One known occurrence is located within the 1-mile buffer of Link

U420 along Lake Fork River near Upalco, Utah. The species is also known to breed along the Green River in Uintah County, Utah.

E.6.2.2 Bureau of Land Management, U.S. Forest Service, and State-Sensitive Fish and Wildlife Species

American Bittern (*Botaurus lentiginosus*) – State: Wyoming

The American bittern's breeding range encompasses the northern half of the United States north through Canada to the Northwest Territories. Wintering birds are found along the southern edges of the United States south to Panama. The species is a heron-like bird that inhabits wetlands dominated by tall, emergent vegetation. American bitterns forage on insects, amphibians, crayfish, and small fish and mammals (Lowther et al. 2009). The eastern half of the Project area is located within the known breeding range for the American bittern. There is a single known occurrence in the Project area located at the western end of Stevies Lake along the Big Ditch west of Hanna, Wyoming (Link W21). The American bittern is likely to occur in the Project area in suitable wetland and marsh habitats.

American Marten (*Martes americana*) – State: Wyoming

The American marten range includes most of North America from Alaska through forested areas in Canada, northeastern United States, and south along western United States mountain ranges. The species is considered uncommon in Wyoming. Old-growth conifer and mixed stands, including spruce-fir, lodgepole pine, and deciduous forests are typical marten habitats. Mesic stands with closed canopies, living branches lower on trees, abundant woody debris, dense understory, and lengthy fire regimes are habitat characteristics where the American marten often dens in tree cavities, rotten logs, or underground. The marten also forages for small mammals, birds, insects, and fruits in riparian, meadow, forest edge, and rocky alpine areas (WGFD 2010a). The American marten has intrasexual overlapping territories. Home range size varies by geographic location and prey densities. Daily activity patterns are diurnal in winter and crepuscular in summer. Predator-prey dynamics are closely linked, with predator abundance and age structure of marten populations fluctuating with relative prey abundance. A further limiting factor is predation by mammalian and avian predators, with a 50 percent survival rate in the first year (Powell et al. 2003). A portion of the Project area lies within the range of the American marten in northeastern Utah and southwestern Wyoming and the species is likely to breed and forage in the Project area.

American Pika (*Ochotona princeps*) – State: Wyoming

The American pika primarily occurs in higher elevation mountainous regions in the western United States. The species is considered common in Wyoming and can be found year-round throughout the state. Talus slopes or rock outcrops associated with grasses, alpine and sub-alpine plants providing a food source are typical American pika habitat characteristics. A portion of the Project area lies within the range of the American pika in northeastern Utah and southwestern Wyoming (WGFD 2010a). The species is likely to breed and forage in suitable habitat in the Project area.

American White Pelican (*Pelecanus erythrorhynchos*) – BLM: Colorado, Utah; State: Utah

The American white pelican is a migratory species that breeds in very localized areas of Wyoming, Colorado, Utah, and Nevada and migrates to the coasts of California and Mexico for the winter (Anderson 1991). The species arrives at breeding grounds in March, where it prefers islands with flat or low gradient slopes associated with fresh water lakes. Preferred foraging areas are shallow lakes, marshlands, and rivers, and are typically over 30 miles from nesting areas. Pelicans are monogamous and pair up after arrival at breeding grounds (Knopf 1979). The species is highly social, nesting in colonies, and often incorporates cooperative feeding strategies (Anderson 1991).

Gunnison Island in the northern arm of the Great Salt Lake is the only known nesting site for the species in Utah and represents one of the four largest breeding colonies in North America (Bosworth 2003). During spring and fall migration, pelicans occur on lakes and reservoirs throughout Utah, Wyoming, and Colorado. The species is regularly observed at the Ouray National Wildlife Refuge in Uintah County, Utah, though breeding has not been observed at this site (USGS 2012). Threats to the species are greatest at nesting colony locations (Bosworth 2003). Migrating or foraging American white pelicans are likely to occur in the Project area.

Aquatic Snails (combined account) – State: Wyoming

Aquatic snails and limpets are soft-bodied mollusks with a spiral, coiled disk-shaped (snails) or cone-shaped (limpets) shell. Approximately 526 species of aquatic snails and limpets are known throughout North America. These species feed on algae, microbes, fungi, and detritus from solid surfaces within aquatic systems (WGFD 2010a). These species can be found in most aquatic systems in the Project area.

Ash-throated Flycatcher (*Myiarchus cinerascens*) State: Wyoming

The ash-throated flycatcher's breeding distribution spans southwestern Oregon, eastern Washington, to southern Idaho, southwestern Wyoming, Colorado, New Mexico, and northern and central Texas. The species occasionally breeds in Oklahoma, Baja California and the mainland of Mexico. Outside of the breeding season, the ash-throated flycatcher can be found in northern Baja California, southeastern California, central Arizona, and south into the mainland of Mexico, El Salvador, and Costa Rica. Desert scrub, pinyon-juniper and oak woodland, chaparral, thorn scrub, and riparian woodland are all suitable habitats of the ash-throated flycatcher. In the Project area, the species most commonly uses pinyon-juniper habitats. Nests are typically found in tree cavities, holes in cacti, and in abandoned woodpecker holes and cactus wren nests (Cardiff and Dittmann 2001). The ash-throated flycatcher is known to occur in the Project area along Red Creek at Richards Gap (Links W492, W493, W520) and along the Little Snake River near the Wyoming/Colorado border (WYNDD 2011). The ash-throated flycatcher is likely to breed and forage in suitable habitats throughout the Project area.

Baird's Sparrow (*Ammodramus bairdii*) – BLM: Wyoming

Baird's sparrow was once considered one of the most common prairie birds in some areas; it is now rare throughout its range and only abundant in local areas with suitable grassland habitat. During breeding season, Baird's sparrow prefers idle or lightly grazed native grasslands. Native prairie appears to be preferred habitat, although there is some use of crested wheatgrass (*Agropyron cristatum*) (Casey 2000). In dry years or drier parts of the range, breeding occurs in grassy sloughs, alkali flats, and depressions in low lying grasslands. Baird's Sparrows leave their breeding grounds in August and spend the winter in extreme southeastern Arizona, southern New Mexico, and Mexico (Luce and Keinath 2003). Non-breeding habitat consists of overgrown fields and open grasslands with very few woody plants greater than 1 meter in height (Gordon 2000). In the United States, breeding occurs in central and eastern Montana, North and South Dakota. In Wyoming, there is circumstantial evidence of breeding in Laramie, Platte, Albany, Converse, and Campbell counties and observations of the species in central and eastern portions of the state during migration (Cеровski et al. 2004). All suspected breeding locations occur outside of the Project area. Transient individuals may fly through the Project area during seasonal migration, but it is a secretive and difficult species to see during migration (Luce and Keinath 2003).

Bald Eagle (*Haliaeetus leucocephalus*) – BLM: Wyoming, Colorado, Utah; USFS: Ashley, Manti-La Sal, and Uinta National Forests; State: Wyoming, Colorado, Utah

Once an endangered species, the FWS now considers the bald eagle fully recovered; the species was delisted on August 8, 2007 (72 FR 37345). It continues to receive federal protection through the Bald and

Golden Eagle Protection Act, the Migratory Bird Treaty Act and is protected as a BLM, USFS, and State sensitive species. Breeding habitat for the bald eagle is typically mature and old-growth forests within 6.5 miles of large bodies of water with availability of food sources such as fish, waterfowl, and sea birds. However, the distance to water may not be as important as the presence of superdominant trees, areas of lower human disturbance, and abundance of fish species (Livingston et al. 1990). Nesting is in either deciduous or conifer, but generally in the largest tree available. Nests are often reused in successive years. Wintering habitat is found along large rivers and unfrozen lakes throughout the range of the species; juveniles are more likely to move large distances than adults that typically only migrate as needed to find food (Buehler 2000).

Both breeding and wintering sites are found in the Project area portions of Wyoming. In Colorado, there is both good wintering and nesting areas, though nesting is uncommon. The Colorado River near Ruby Canyon (30 miles downstream of the confluence with the Gunnison River) and Horsethief Canyon State Wildlife Area are known nesting locations and in the Project area. In Utah, the species is widespread during winter, but very few known breeding pairs exist. According to available data, one nest site occurs in Emery County south of Castledale (approximately 4 miles southwest of Link U731) and two occur in Grand County (one along the Colorado River near Nine Mile Bottom approximately 6 miles southeast of Link U490 along the Colorado River between the Colorado-Utah border and Bitter Creek approximately 5 miles southeast of Link U490) (Bosworth 2003).

Big Brown Bat (*Eptesicus fuscus*) – State: Wyoming

A medium to large bat, the big brown bat is a habitat generalist, found in timberline meadows to lowland deserts, although it is most abundant in deciduous forest and suburban and mixed agricultural use areas (Bat Conservation International 2009a). Maternity roosts are established in buildings, barns, bridges, and bat houses. The species hibernates in caves, preferring areas near the cave entrance where temperatures are low and the relative humidity is below 100 percent (Schmidly 1991). Often big brown bats are found in association with Yuma and little brown myotis, and Brazilian free-tailed and pallid bats (Schmidly 1991). Big brown bats forage in tree foliage or cleared meadows with small beetles comprising the majority of the diet (Barbour and Davis 1969; Bat Conservation International 2009a; Schmidly 1991). Caves, trees, mines, buildings, bridges, rock crevices, cliff swallow nests, and tunnels are used for day roosts (Bradley et al. 2006; Schmidly 1991), with roosts containing small groups of bats to several hundred (Bradley et al. 2006). The big brown bat occurs from extreme northern Canada all the way to the extreme southern tip of Mexico (Bat Conservation International 2009a). There are no known occurrences of big brown bats within or near the Project area; however, the entire Project lies within the range of the species.

Big Free-tailed Bat (*Nyctinomops macrotis*) – BLM: Utah; State: Utah

The big free-tailed bat is associated with canyon lands and very rocky country. It is generally associated with floodplain-arroyo habitats at low elevation in Nevada (Bradley et al. 2006) and lowland riparian, desert shrub, and montane forests of Colorado and Utah (Oliver 2000). The species primarily roosts on cliff faces, but occasionally has been found in buildings and caves (Bradley et al. 2006). The big free-tailed bat is a summer resident of Colorado and Utah. In Colorado, it is found on both sides of the Continental Divide as far north as the Colorado River in Mesa County. In Utah it has been found as far north as Utah County (Bradley et al. 2006). Portions of the Project area are located within summer range of the species and contain suitable habitat; the big free-tailed bat is likely to forage throughout the Project area in Colorado and Utah.

Bigmouth Shiner (*Notropis dorsalis*) – State: Wyoming

The bigmouth shiner inhabits riverine systems from northern Minnesota to eastern Illinois and west to central Wyoming (WGFD 2010a). The species is not found in the Project area, but inhabits the Platte River system, which may be affected from drawdown of water from the Platte River watershed as a result of project-related water usage.

Black-rosey Finch (*Leucosticte atrata*) – State: Wyoming

The black rosy finch is found throughout the Great Basin and Intermountain regions of the United States. The species seasonally migrates between lower and higher elevations, and rarely nests below 10,000 feet in elevation (WGFD 2010a). The species is often observed in winter in grasslands, agricultural areas, roadsides, and residential areas (WGFD 2010a). The black rosy finch primarily feeds on seeds and insects with seeds being the dominate food source during the winter (Johnson 2002). The entire the Project area lies within the known range of the black rosy finch. The Heritage data provided included one known occurrence of the species from in the Project area near Crescent Junction, Utah, approximately 7 miles west of Thompson along Link U490. The black rosy finch may forage and winter in the Project area.

Black Swift (*Cypseloides niger*) – BLM: Utah; State: Utah

The black swift is an elusive bird that feeds at high altitudes. The black swift's nest site requirements are very specialized; nests are always found behind waterfalls in dark recesses with unobstructed access (Knorr 1961). Black swifts typically nest in colonies of less than 10 pairs (Marín 1997) and lay only one egg. In Utah and Colorado, breeding occurs in localized areas. The species migrates out of the Project area for winter. Known breeding sites occur in Utah at Bridal Veil Falls, Aspen Grove, and Stewart Falls in the Uinta National Forest, all near Provo (UDWR 2006), and in Colorado from Garfield County (NatureServe 2009). The black swift may migrate through the Project area, but nesting individuals are unlikely to occur near transmission line alternative routes. One known occurrence crosses the centerline of Link U420 along Red Creek near Fruitland, Utah.

Black Tern (*Chlidonias niger*) – BLM: Colorado; State: Wyoming

The black tern is a localized breeder throughout most of the northern Great Plains and Great Basin and winter along the coasts of Central and South America. It nests in semi-colonies, in shallow, freshwater wetlands on floating material or on the ground in the emergent vegetation. Nests are typically within several feet of open water (Casey 2000). The Project area is on the southern boundary of the breeding range of the species, but the black tern is known to occur in the Project area. The species is believed to breed in the vicinity of Elk Mountain, Wyoming, but breeding has not been confirmed (Cеровski et al. 2004). Breeding has not been documented elsewhere in the Project area, though suitable wetland habitat can also be found in Colorado and Utah (Ridgely et al. 2007). Black tern occurrences have been noted from Pelican Lake (Utah), Ouray (Utah), and Hogback Lake (Wyoming).

Black-crowned Night-heron (*Nycticorax nycticorax*) – State: Wyoming

The black-crowned night-heron inhabits most of the western hemisphere from Saskatchewan and Alberta south to Tierra del Fuego, Argentina. The species inhabits a wide variety of wetland habitats including fresh, brackish, and salt-water situations such as swamps, streams, rivers, pools, ponds, lakes, lagoons, tidal mudflats, salt marsh, freshwater marsh, ditches, canals, reservoirs, and wet agricultural fields. Black-crowned night-herons wade through shallow waters feeding on a wide variety of foods such as leeches, earthworms, aquatic and terrestrial insects, prawns and crayfish, clams, mussels, squid, fish, amphibians, lizards, snakes, turtles, small mammals, birds, eggs, plant materials, and even garbage from landfills (Hothem et al. 2010). There are no known occurrences in the Project area; however, the majority of the

Project area falls within the known range of the black-crowned night-heron. The black-crowned night-heron is likely to breed and forage in suitable wetland habitats in the Project area.

Bluehead Sucker (*Catostomus discobolus*) – BLM: Wyoming, Colorado, Utah; State: Wyoming, Utah

The bluehead sucker occurs in mountain streams and large rivers that are often turbid or muddy and sometimes alkaline. It is usually found in swift currents, but has also been found in moderate to still water with very little vegetation (UDWR 1998). Current known distribution of the bluehead sucker includes the Little Snake (Carbon County) and Green (Sweetwater County) River drainages in Wyoming; the Little Snake and Green (Moffat County), White (Rio Blanco County), and Colorado (Mesa County) River drainages in Colorado; and the Colorado River Drainage including the Colorado (Grand County), Green (Uintah, Emery, and Grand counties), San Rafael (Emery County), Price (Carbon County), and White (Uintah County) rivers in Utah (UDWR 1998). The bluehead sucker is threatened by habitat alteration and loss, introduction of exotic fishes, and hybridization with other species of sucker (UDWR 1998). Populations of the species may be declining (UDWR 1998; WGFD 2010a). Transmission line alternative routes are located within the known range of the bluehead sucker in Wyoming, Colorado, and Utah. The bluehead sucker is known to occur in the Project area.

Bobolink (*Dolichonyx oryzivorus*) – BLM: Utah; State: Wyoming, Utah

The bobolink is a neotropical migrant that has one of the longest annual migrations of any North American songbird, approximately 12,500 miles. The species is found throughout the northern United States from the east to the west. The species leaves breeding grounds in August and winters in southern South America. In the west, the bobolink nests and forages primarily in wet meadows, wet grasslands, and irrigated agricultural fields associated with riparian or wetland areas. Nests are built on the ground, often located at the base of large forbs (UDWR 2006). Habitat for the bobolink is found throughout Wyoming, Colorado, and Utah. Isolated breeding populations occur in northern Utah, primarily along the Wasatch Mountains (Bosworth 2003). In Wyoming, bobolinks have been observed throughout the state, but are considered to be an uncommon summer resident (WGFD 2010a). In Colorado, substantial populations occur in the Yampa and White River valleys, and near Boulder, Colorado (Beason et al. 2008). The bobolink may breed and forage in suitable habitats in the Project area.

Bonneville Cutthroat Trout (*Oncorhynchus clarki utah*) – BLM: Utah; USFS: Manti-La Sal and Uinta National Forest; State: Wyoming, Utah

The Bonneville cutthroat trout occurs in streams and lakes of the Bonneville Basin and Virgin River drainage. It is typically found in headwater streams at high elevations entering and exiting the Bonneville Basin, but also located in perennial streams of the Deep Creek Mountains and the Virgin River drainage in the Pine Valley Mountains. The species is threatened by loss, degradation, and fragmentation of habitat, overutilization, hybridization with non-native trout, and disease (Bosworth 2003). Bonneville cutthroat trout was formally believed to be extinct (UDWR 1998). Conservation and stocking efforts have stabilized many extant populations, re-established extirpated populations, and expanded the range of the species (Bosworth 2003). Current known distribution of the Bonneville cutthroat trout includes streams in the Deep Creek Mountains and the Santa Clara, Sevier, and Virgin River drainages in Utah and Nevada (UDWR 1998). Suitable habitat for the species can be found on the Manti-La Sal and Uinta National Forests. Transmission line alternative routes are located within the known range of the Bonneville cutthroat trout in Utah and the species is known to occur in the Project area. Known occurrences of the species that in the Project area are located in Lake Fork east of Thistle, Utah, where this creek is crossed by Link U460; along Sheep Creek where it is crossed by Link U420; and in Tie Fork where it is crossed by Link U539.

Brassy Minnow (*Hybognathus hankinsoni*) – State: Wyoming, Colorado

The brassy minnow inhabits the Missouri and upper Mississippi river drainages from eastern Wyoming and Montana across the northern states to Ontario and New York and south to Kansas and Missouri (WGFD 2010a). The species is not found in the Project area, but inhabits the Platte River system that may be affected from drawdown of water from the Platte River watershed as a result of project-related water usage.

Brewer's Sparrow (*Spizella breweri*) – BLM: Wyoming, Colorado; State: Wyoming

Brewer's sparrow is a neotropical migrant; though some populations may only migrate a short distance between breeding and wintering grounds. The species breeds from southeastern Alaska and Saskatchewan south to southern California and southwestern Kansas. Brewer's sparrow migrates south to winter between southern California, western Texas, and central Mexico. Within the species breeding range, the Brewer's sparrow is considered a shrub steppe obligate, strongly associated with sagebrush in areas with scattered shrubs and short grass. It nests low in sagebrush, other shrub, or cactus. It is mainly a Great Basin species, but occurs in shrub steppe habitats in all states in the Project area, breeding throughout Utah, Wyoming, and western Colorado. The entire Project area lies within the breeding range of the species and the Brewer's sparrow is known to occur in suitable habitats throughout the entire Project area during the breeding season (mid-April through July) (Rotenberry et al. 1999).

Brown-capped Rosy Finch (*Leucosticte australis*) – State: Wyoming

The species inhabits the mountainous areas of extreme southern Wyoming through Colorado and into northern New Mexico. The species is considered relatively sedentary and only migrates elevationally with the seasons. Brown-capped rosy finches inhabit cliffs, caves, rock slides, or old buildings during breeding season and open areas including alpine tundra and high parks and meadows during the winter. Brown-capped rosy finches rarely nest below 10,000 feet (WGFD 2010a). The species forages on seeds, insects, and spiders (Johnson et al. 2000). The Project area lies on the boundary of the known range for the species in Colorado and Wyoming (WGFD 2010a). The brown-capped rosy finch may forage and winter in the Project area.

Burrowing Owl (*Athene cunicularia*) – BLM: Wyoming, Utah; State: Wyoming, Colorado, Utah

The burrowing owl is a small, ground-dwelling owl with relatively long legs. The species is often seen active during the day, with peaks at dawn and dusk. The burrowing owl is a neotropical migrant that breeds throughout the Western United States and migrates to southern California and Central America during the winter. The species lives in a variety of shrub-dominated or sparsely vegetated habitats within deserts, grasslands, prairies, farmland, and sagebrush steppe communities. They nest in previously excavated burrows in the ground and are largely dependent on prairie dog colonies or other fossorial mammals for suitable nesting sites (NatureServe 2009). Occasionally, burrowing owls nest in manmade structures such as culverts. The entire Project area lies within the breeding range of the species and the burrowing owl is known to breed and forage throughout the Project area (Bosworth 2003). Over 60 known burrowing owl occurrences fall in the Project area in Colorado, Utah, and Wyoming.

Bushtit (*Psaltirparus minimus*) – State: Wyoming

The bushtit is found throughout much of the western United States from extreme southern British Columbia south through central Mexico to Guatemala. The species inhabits a wide variety of habitats from forested mountains to arid brush. Bushtits tend to prefer open mixed woodland with some evergreen foliage or shrubby understory. In the Project area, the bushtit nests only in juniper woodlands (WGFD

2010a). The species forages by gleaning small insects and spiders from vegetation (Sloane 2001). The Project area is within the known range of the bushtit and the species is likely to breed and forage in suitable habitats in the Project area.

California Floater (*Anodonta californiensis*) – State: Wyoming, Utah

The California floater is a freshwater mussel that inhabits lakes, ponds, and low-gradient streams (UDWR 2010a). There are currently seven known California floater populations in eastern Utah. Several historic populations (including Utah Lake) have been extirpated, and reported sightings of the California floater in Tooele County have not been verified (Oliver and Bosworth 1999). The distribution of the California floater in Wyoming is limited to extreme western Lincoln and Uinta counties (WGFD 2010a). The only known California floater population in the Project area occurs within the Burraston Ponds south of Mona (1 mile of the centerline of Link U650). Specimens have been collected at this location.

Canvasback (*Aythya valisineria*) – State: Wyoming

Regulatory Status

The WGFD classifies the canvasback as a Species of Special Concern with a Native Species Status of 3 because its breeding population in Wyoming is restricted in numbers, habitat is restricted, and is vulnerable with no recent or on-going significant loss (WGFD 2010a).

Taxonomy and Life History

Canvasbacks are ecological specialists and require deep, open, permanent ponds, marshes and potholes for feeding, resting, and courtship activities. They are omnivorous and their diet consists of aquatic vegetation and aquatic invertebrates. Breeding may occur in small lakes, deep-water marshes, sheltered bays of large freshwater and alkali lakes, permanent and semi-permanent ponds, sloughs, potholes and shallow river impoundments. Females usually breed in their natal area and may either make a floating nest, or nest on top of a muskrat house. Nests are made of loosely woven reeds and sedges. In aspen parklands and mixed-grass prairies, the preferred breeding habitat is semi-permanent and permanent, shallow marshes bordered by dense emergent vegetation, including bulrushes, cattails and reed grass. Brood rearing often takes place in the same habitat as breeding (WGFD 2010a).

Distribution and Habitat Requirements

Breeding grounds are from Alaska to California and Nebraska with the highest densities in the prairie-parklands of southern Canada. Canvasbacks winter along the Atlantic Coast, Mississippi River delta and delta lakes in Louisiana, Gulf coast, and Pacific coast. In Wyoming, canvasbacks are much less common during the breeding season than during migration. Most of the breeding effort has been observed in the south-central and western portions of the state. The canvasback has low abundance in Wyoming and is considered an uncommon summer resident (WGFD 2010a).

Primary Threats to Survival

There are no ongoing efforts to delineate important habitats for canvasbacks in Wyoming. The species is susceptible to impacts from energy development and other large-scale projects that destroy or impair suitable habitats. Human encroachment of wetlands is impacting the species. Heavy livestock grazing in wetland margins can adversely impact brood rearing habitat. Population status and trends of the species are not well-known in Wyoming, but the continental population appears stable. Species may be susceptible to impacts caused by climate change (WGFD 2010a).

Occurrence in the Project Area

Heritage data indicated the canvasback is not known to occur in the Project area (WYNDD 2011). However, Christmas Bird Count and Breeding Bird Survey data include occurrences of the species near water bodies in the Project area (Gough et al. 1998). Seasonal migrants of the species may occur in portions of the Project area.

Canyon Mouse (*Peromyscus crinitus*) – State: Wyoming

Canyon mouse habitat distribution includes Oregon south to northwestern Mexico and east to Colorado and Wyoming. The species is considered rare in Wyoming as it is likely limited to isolated bluffs and tabletop mesas of Sweetwater County. In Wyoming, the canyon mouse occurs in limber pine or juniper areas with sandy soil for digging burrows or sandstone rock outcrops that provide shelter. A portion of the Project area lies within the range of the canyon mouse in northeastern Utah, northwestern Colorado, and southwestern Wyoming (WGFD 2010a). The species is likely to breed and forage in suitable habitat in the Project area.

Caspian Tern (*Hydroprogne caspia*) – State: Wyoming

The Caspian tern is found throughout the world. In North America, the species has a widely scattered distribution inhabits coastal estuarine, salt marsh, and islands along the coastlines to rivers and salt lakes in the interior of the continent. Caspian terns feed primarily on fish, only occasionally taking crayfish and insects (Cuthbert and Wires 1999). There is a single known occurrence of the species on the edge of the Project area at Lake Boreham west of Myton, Utah, along Link U430. The Project is within the known range of the Caspian tern and the species is likely to breed and forage in the Project area.

Chestnut-collared Longspur (*Calcarius ornatus*) – State: Wyoming

The chestnut-collared longspur's breeding range includes southern Alberta to southern Manitoba, southeast of the Rocky Mountains to northeastern Colorado, western Kansas, north-central Nebraska, and western Minnesota, with a non-breeding range that includes California, northern Arizona, eastern New Mexico, eastern Colorado, and central Kansas south to northern Sonora, Chihuahua, Zacatecas, San Luis Potosi, and southern Texas. Cropland/hedgerow, grassland/herbaceous, and desert are all terrestrial habitats of the chestnut-collared longspur. During the breeding season the species uses level to rolling mixed-grass and shortgrass uplands, and moist lowlands in drier habitats. Grasslands and deserts with primarily grasses and forbs, as well as cultivated fields near water sources are used during non-breeding parts of the year. The species avoids shrubby areas, but uses scattered shrubs and other lower perches for singing (WGFD 2010a). The chestnut-collared longspur is known to occur in the Project area (WYNDD 2011) and is likely to breed and forage in suitable habitat in the Project area in Colorado and Wyoming.

Clark's Grebe (*Aechmophorus clarkii*) – State: Wyoming

The breeding range of Clark's grebe extends from Washington to Wyoming, south to California, Arizona, New Mexico and Mexico, and winters from on the Pacific coast from central California south to Mexico. Clark's grebe habitats include marshes, lakes and bays during migration and also along sheltered seacoasts in winter. They typically nest among tall plants growing in water on the edge of large areas of open water systems including estuaries, lagoons, rivers, lakes, and wetlands. Drought-related habitat changes have degraded some of the historic nesting sites and reduced the number of nesting pairs detected during the past several years (WGFD 2010a). There are known occurrences of Clark's grebe near transmission line alternative routes.

Cliff Chipmunk (*Tamias dorsalis*) – State: Wyoming

Cliff chipmunk habitat distribution includes from southern Idaho south into northern Mexico. The species is considered rare in Wyoming as it is limited to areas of rock outcrops near Sage Creek in Sweetwater County. The cliff chipmunk inhabits steep, rocky hillsides, rock outcrops, cliffs, and talus slopes in juniper woodlands where it nests in cliff crevices, rocky bluffs and underground burrows. A portion of the Project area lies within the range of the cliff chipmunk in northeastern Utah, northwestern Colorado, and southwestern Wyoming (WGFD 2010a). The species is likely to breed and forage in suitable habitat in the Project area.

Colorado River Cutthroat Trout (*Oncorhynchus clarki pleuriticus*) – BLM: Wyoming, Colorado, Utah; USFS: Ashley, Manti-La Sal, and Uinta National Forests; State: Wyoming, Colorado, Utah

The Colorado River cutthroat trout is endemic to the cold tributaries of the Green and Colorado River systems where it occupies headwater streams and mountain lakes. The species is threatened by loss, degradation, and fragmentation of habitat, overutilization, hybridization with non-native trout, and disease (Bosworth 2003). The range of the species has dramatically declined since the mid-1800s and currently occupies approximately 13 percent of its historic range (Hirsch et al. 2006). Recent conservation actions and re-introductions have helped to reduce threats and stabilize populations. Rangewide populations are probably increasing (Bosworth 2003). The Colorado River cutthroat trout is known to occur in the Project area in headwater streams of the Green, Little Snake, Colorado, and Yampa rivers. Known occurrences crossed by centerlines occur in the Indian Creek where crossed by Link U630 and in South Fork Gordon Creek where crossed by Link U537.

Columbia Spotted Frog (*Rana luteiventris*) – BLM: Wyoming, Utah; USFS: Ashley, Manti-La Sal, and Uinta National Forests; State: Wyoming, Utah

The Columbia spotted frog is a highly aquatic frog with a relatively large range in the northwestern United States and British Columbia (Stebbins 2003). An inhabitant of ponds, creeks, streams, and lakes, they are frequently found in areas with dense willows (*Salix* spp.) and basking sites (Reaser and Pilliod 2005). The species is not known to occur in Colorado and the Project area is outside of the species range in Wyoming (WGFD 2010a). In Utah, populations of Colombia spotted frogs have declined and are threatened by habitat loss, competition with nonnative species, and disease (Bailey et al. 2006). The Columbia spotted frog is known to occur in Juab, Sanpete, Utah, and Wasatch counties in Utah (NatureServe 2009). Known occurrences within 1-mile of transmission line alternative routes are located along Links U600, U631, and U650. Known occurrences south of Burraston Ponds (south of Mona, Utah) in the creeks and washes where it is crossed by Link U650.

Columbian Sharp-tailed Grouse (*Tympanuchus phasianellus columbianus*) – BLM: Wyoming, Colorado, Utah; State: Wyoming, Colorado

The Columbian sharp-tailed grouse is one of six recognized subspecies of the sharp-tailed grouse in North America, based on geographic location, size, plumage, and types of habitat that it occupies. The Columbian sharp-tailed grouse inhabits big sagebrush (*Artemisia tridentata*), shrubsteppe, mountain shrub, and riparian shrub plant communities. It nests near or under shrubs or small trees if available (Hoffman and Thomas 2007). Leks of Columbian sharp-tailed grouse are on knolls, ridge-tops, or benches that are higher than the surrounding topography; leks are often in taller vegetation and shrub cover than the other subspecies. Nests are typically located within 0.6 mile of the lek at which they were hatched (Giesen and Connelly 1993). The species does not migrate outside of the breeding range, but may move short distances due to snow. Columbian sharp-tailed grouse is known to occur in the Project area in south-central portion of Wyoming in Carbon County immediately west and north of the Medicine Bow

National Forest and in Moffat and Rio Blanco counties in Colorado (Hoffman and Thomas 2007). There are known occurrences in the Project area along Link C13.

Common Loon (*Gavia immer*) – State: Wyoming

The common loon's breeding range includes Iceland, Greenland, and the lake regions of the northern United States and Canada. The winter range is located along the Pacific, Atlantic, and Gulf coasts. In Wyoming, the common loon distribution is small and nests only occur in northwestern parts of the state, although the common loon is found on lakes across most of Wyoming during migration. Breeding habitat requires both shallow and deep water areas with nest sites on small islands, quiet backwaters, or mainland shores. Ideal common loon nesting lakes have at least partially forested, rocky shorelines; an area of shallow water with emergent vegetation; and a steep slope along the shoreline for an underwater approach to nests (WGFD 2010a). Given its range and predicted distribution, the common loon is likely to occur in the Project area.

Common Shiner (*Luxilus cornutus*) – State: Wyoming, Colorado

The common shiner inhabits riverine systems across the eastern United States and Canada west to eastern Wyoming (WGFD 2010a). The species is not found in the Project area, but inhabits the Platte River system that may be affected from drawdown of water from the Platte River watershed as a result of project-related water usage.

Cornsnake (*Elaphe guttata*) – BLM: Utah; State: Utah

The cornsnake is primarily known from east of the continental divide (Bosworth 2003). The species is found in moist areas such as stream courses, canyons, arroyos, mountain streams, and farmland. Important components of cornsnake habitat are a permanent water source and good cover for daytime retreat or hibernation. Although primarily a diurnal species, this snake is active at night in warm weather (Degenhardt et al. 1996; Stebbins 2003). This constrictor's flattened belly makes it an excellent climber, enabling it to forage in trees and shrubs for small mammals, lizards, birds and their eggs, and even climb cave walls while hunting bats (Degenhardt et al. 1996; Stebbins 2003). Scattered populations of cornsnake occur in Utah along the Colorado and Green River corridors from Moab in Grand County to Dinosaur National Monument in Uintah County (Bosworth 2003). Suitable habitat for the cornsnake occurs in the Project area and the species may occur along transmission line alternative routes that are near the Green and Colorado rivers and their tributaries.

Desert Bighorn Sheep (*Ovis canadensis nelsoni*) – BLM: Colorado; USFS: Manti-La Sal National Forest

The desert bighorn sheep is at home in the rugged, steep mountains and canyons of the western United States and northern Mexico. The range of *O. c nelsoni* extends from central Nevada, across the southern third of Utah, northwestern Arizona, and southern California (Shackelton 1985). For a detailed species account refer to Section 3.2.7.4.

Devil Crayfish (*Cambarus diogenes*) – State: Wyoming

The devil crayfish are crustaceans with red tips on their pincers and along the margins of their body. The species has a large native range from Ontario, Canada, to Texas and Wyoming to North Carolina. The species builds burrows in forested habitats near temporary or permanent water or where the water table is near the surface (WGFD 2010a). There are no known occurrences of the species in the Project area; however, potentially suitable habitat may be present in the Project area.

Dwarf Shrew (*Sorex nanus*) – State: Wyoming

Local populations of dwarf shrew are distributed from Montana and South Dakota south to Arizona and New Mexico. The dwarf shrew likely occurs in small isolated populations as it is considered rare in Wyoming. The dwarf shrew is not limited to areas near permanent water and occurs in diverse habitats including alpine tundra, subalpine forests, rock-sides, montane forests, and foothills to arid shortgrass prairie. A portion of the Project area lies within the range of the dwarf shrew in northeastern Utah, northwestern Colorado, and southwestern Wyoming (WGFD 2010a). The species is likely to breed and forage in suitable habitat in or near the Project area.

Eastern Red Bat (*Lasiurus borealis*) – State: Wyoming

The habitat distribution of the eastern red bat includes most of the eastern United States from the Continental Divide to Canada south to Mexico. The red bat occurs seasonally in the eastern third of Wyoming and is considered rare in the state. Red bat foraging habitats include forested areas, riparian corridors, and shelter belts of vegetation where they primarily predate moths and other soft bodied insects. Roosts typically occur in mature hardwoods, shrubs, and conifers, and occasionally on the ground in leaf litter. A portion of the Project area lies within the range of the eastern red bat in southwestern Wyoming (WGFD 2010a). The species is likely to breed and forage in suitable habitat in or near the Project area.

Eureka Mountainsnail (*Oreohelix eurekaensis*) – State: Utah

The Eureka mountainsnail is endemic to Utah and has only been documented in Juab, Duchesne, Tooele counties, with one population in northern Grand County. The species of terrestrial snail is found in shrubland and forested habitats, usually around limestone outcrops or soils with high calcium concentration (UDWR 2010a). There is one known Eureka mountainsnail occurrence in the Project area in the Red Narrows on the southern end of Uinta National Forest and other occurrences have been noted in vicinity. The Eureka mountainsnail is likely to occur in suitable habitats in the Project area.

Fairy and Tadpole Shrimp (combined account) – State: Wyoming

Fairy shrimp are found throughout North America. Tadpole shrimp inhabit areas west of the Mississippi River and in the Arctic of North America. These species range in size from 0.4 to 2.4 inches in length. Both fairy and tadpole shrimp inhabit temporary wetlands as well as permanent waters (WGFD 2010a). There are no known occurrences of the species in the Project area; however, potentially suitable habitat may be present in the Project area.

Fatmucket (*Lampsilis siliquoidea*) – State: Wyoming

The fatmucket is known from river systems throughout the Midwest as far west as Wyoming (WGFD 2010a). The species is not found in the Project area, but inhabits the Platte River system that may be affected from drawdown of water from the Platte River watershed as a result of project-related water usage.

Ferruginous Hawk (*Buteo regalis*) – BLM: Wyoming, Colorado, Utah; State: Wyoming, Colorado, Utah

During the breeding season, ferruginous hawk habitat includes grasslands, agricultural lands, sagebrush/saltbush/greasewood shrub lands and the interface between pinyon-juniper and shrubsteppe habitats. The species is known to breed from the Canadian Prairie Provinces south to Oregon, Nevada, Arizona and Oklahoma (WGFD 2010a). Nesting sites are elevated, often in cliffs, buttes, and creek banks. During the winter, the species migrates south to the central and southern portions of its breeding range.

south into Baja California where it uses open farmlands, grasslands, deserts, and other arid regions (WGFD 2010a). The species' diet consists of lagomorphs, pocket gophers, and prairie dogs, but can also include other small mammals and birds (Bechard and Schmutz 1995).

The western two-thirds of Carbon County has one of the highest nesting densities of ferruginous hawks in Wyoming (BLM 2012d). In Colorado, ferruginous hawks nest in the eastern prairies, but have also been observed in the northwestern portion of the state (Beidleman 2000). The species occurs throughout most of Utah, in appropriate habitat. It is most prevalent in the southern Bonneville Basin in southwest Utah and the Colorado Plateau in eastern Utah (Bosworth 2003). The species is known to breed and forage and is believed to be relatively common throughout the Project area.

Flammulated Owl (*Otus flammeolus*) – USFS: Ashley, Manti-La Sal, and Uinta National Forests

The flammulated owl is a migratory cavity-nesting owl of mid-elevation, open ponderosa pine or other similarly structured dry forest. Nesting occurs from southernmost British Columbia through the forested ranges of Washington, Oregon, and portions of California and Nevada into central Mexico (Mccallum 1994). The species winters from central Mexico to Guatemala (Ehrlich et al. 1988), with migration most likely being tied to prey availability. The species consumes nocturnal arthropods, especially moths, beetles, crickets, and grasshoppers (Mccallum 1994). Flammulated owls inhabit mid-level open conifer forests, and are associated with ridges and upper slopes. The species is a secondary cavity nester and prefers mature growth forest. The Project area is within the known breeding range of the flammulated owl and the species is known to occur on the Ashley, Uinta, and Manti-La Sal National Forests (USFS 2013b). The flammulated owl has been observed in the Project area north of Helper, Utah, along Link U545 (UNHP 2012).

Flannemouth Sucker (*Catostomus latipinnis*) – BLM: Wyoming, Colorado, Utah; State: Wyoming, Utah

The flannemouth sucker inhabits pools or streams and large rivers with little to no vegetation and clear to murky waters over rock, gravel, or mud substrate. The species was once widespread throughout the Colorado River basin but currently only occupies 45 percent of their historic range (WGFD 2010a). Threats to the species include habitat fragmentation and competition and hybridization with non-native fishes (WGFD 2010a). Current known distribution of the flannemouth sucker includes the Little Snake (Carbon County) and Green (Sweetwater County) River drainages in Wyoming; the Little Snake and Green (Moffat County) and Colorado (Mesa County) River drainages in Colorado; and the Colorado River drainage including the Colorado (Grand County), Green (Uintah, Emery, and Grand counties), San Rafael (Emery County), and Price (Carbon County) rivers in Utah (UDWR 1998). Some transmission line alternative routes are located within the known range of the flannemouth sucker in Wyoming, Colorado, and Utah and the species is known to occur in the Project area.

Flathead Chub (*Platygobio gracilis*) – State: Wyoming

The flathead chub inhabits turbid rivers of the Great Plains from the Northwest Territory in Canada south to Oklahoma and New Mexico (WGFD 2010a). The species is not found in the Project area, but inhabits the Platte River system that may be affected from drawdown of water from the Platte River watershed as a result of project-related water usage.

Forster's Tern (*Sterna forsteri*) – State: Wyoming

The breeding range for Forster's tern includes the Central Prairie Provinces of Canada south to southern California, western Nevada, southern Idaho, northern Utah, northern and eastern Colorado, central

Kansas, western, Nebraska, northern Iowa, northwestern Indiana, to eastern Michigan; coastally from northeastern Mexico, southeastern Texas to southern Alabama; along the Atlantic coast from Long Island to South Carolina. Forster's tern winters in central California and Baja California to Oaxaca and Guatemala, Costa Rica; northern Veracruz to western Florida; Virginia to northern Florida; Bahamas and Greater Antilles. The Forster's tern breeds in marshes with lots of open water and large stands of island-like vegetation. It winters in marshes, coastal beaches, lakes and rivers (McNicholl et al. 2001). Three occurrences of the Forster's tern southwest of Rawlins near Hogback Lake (Link W30) are known within transmission line alternative routes.

Franklin's Gull (*Leucophaeus pipixcan*) – State: Wyoming

During summer, Franklin's gull is found in Alberta and Saskatchewan, Canada south to northern South Dakota with disjunct populations in northwestern Wyoming, along the Great Salt Lake in Utah, and near Reno, Nevada. The species winter along the Pacific coast of South America. The species breeds along freshwater marshes and always nests over water on floating mats built on the water's surface, on muskrat houses, or on floating debris. Franklin's gull has a highly variable diet feeding on invertebrates (earthworms, grubs, insects, snails), seeds and other vegetable matter, mice, fish, and crabs (Burger and Gochfeld 2009). Most Franklin's gull populations are known from outside of the Project area. However, the species may occur in suitable aquatic habitats in the Project area in Wyoming (WGFD 2010a).

Fringed Myotis (*Myotis thysanodes*) – BLM: Wyoming, Colorado, Utah; State: Wyoming, Utah

The fringed myotis occurs in a wide range of habitat from lowland riparian and desert shrub to montane forests and meadows at an elevation range of 2,400 to 8,900 feet. It typically roosts in caves, mines, and buildings (Bradley et al. 2006). The fringed myotis most likely does not migrate, but hibernates during the winter (Oliver 2000). It is widely distributed throughout Wyoming, Colorado, and Utah, but is not common. The Project area is located within the range of the species and contains suitable habitat. The fringed myotis is likely to forage throughout the Project area in Wyoming, Colorado, and Utah.

Grasshopper Sparrow (*Ammodramus savannarum*) – BLM: Utah; State: Wyoming, Utah

The grasshopper sparrow is a neotropical migrant that breeds throughout the Great Plains and eastern United States and spends winters in the southern United States, Mexico, and Central America. It prefers grasslands with moderately deep litter, patches of vegetation alternated with bare surface areas, and sparse woody vegetation coverage (Smith 1963). Grasshopper sparrows nest on the ground at the bases of grass clumps from April to June (Vickery 1996). The Project area is on the border of the species' range and breeding is believed to be rare in the western Wyoming and Utah (Bosworth 2003; WGFD 2010a). Grasshopper sparrow may occasionally breed in the Uinta Basin, but no heritage records exist in the area (Bosworth 2003). The grasshopper sparrow is likely to occur transiently in the Project area during seasonal migrations, and may occasionally use the Project area for breeding or foraging.

Gray Wolf (*Canis lupus*) – State: Colorado, Utah

Today, the gray wolf is found south of Canada only in northern Mexico, a few areas in the Rocky Mountains (reintroduction sites in Montana, Wyoming and Idaho), northwestern Great Lakes region and Cascade Mountains of northern Washington. Formerly, gray wolves were much more numerous in the Rocky Mountain states than in the southwestern United States. The gray wolf is a habitat generalist, with large stable home ranges and exclusive pack territories. Wolf packs generally consist of a breeding pair and offspring. Travel patterns across home ranges are influenced by elevation, topography, prey distribution and climatic conditions; travel routes along roads, trails and survey lines for efficiency are common (Paquet and Carbyn 2003). In addition to avoiding roads and human activity, the gray wolf

selects den sites (natal and secondary) according to proximity of stable food and water resources; selecting for close proximity to ungulate prey species and often denning along ungulate migration routes. Den sites are also located relative to adjacent wolf pack proximity. However, territory overlap with other apex and meso-predators occurs. Limiting factors include climate, prey density, human-induced mortality and disease (Paquet and Carbyn 2003). There are currently no known occurrences of wolves in Utah or Colorado. In the Project area, there is one known occurrence near Baggs, Wyoming. This wolf was a confirmed identification by WGFD biologists in 2003; however, an exact location is not known.

Great Basin Gopher Snake (*Pituophis catenifer deserticola*) – State: Wyoming

The Great Basin gopher snake is found from southern British Columbia to northern Arizona and from Nevada to Colorado in sagebrush and desert habitats (Stebbins 2003; WGFD 2010a). The species primarily feeds on small mammals such as mice, gophers, ground squirrels, and rabbits (WGFD 2010a). Except for Carbon County, Wyoming, the entire Project area lies within the known range of the Great Basin gopher snake. The Great Basin gopher snake is likely to occur in the Project area.

Great Basin Pocket Mouse (*Perognathus parvus*) – State: Wyoming

The Great Basin pocket mouse distribution includes the majority of the Great Basin from south-central British Columbia south to southern California and northern Arizona. The species is considered rare in Wyoming as it only occurs in the southwestern corner of the state. Sagebrush dominated areas, steppe and arid open shrub and woodlands are typical Great Basin pocket mouse habitats. A portion of the Project area lies within the range of the Great Basin pocket mouse in southwestern Wyoming and central Utah (WGFD 2010a). The species is likely to breed and forage in suitable habitat in the Project area.

Great Basin Spadefoot (*Spea intermontana*) – BLM: Wyoming, Colorado; State: Wyoming

The Great Basin spadefoot lives in drier habitats than most amphibians. It is fairly abundant throughout the Great Basin, but becoming rarer at the extremities of the Great Basin in southern Wyoming and western Colorado (UDWR 2005a). The Great Basin spadefoot is found in sagebrush communities below 6,000 feet with loose soil for burrowing. The Great Basin spadefoot is found primarily west of the Continental Divide in the Wyoming Basin and Green River Valley in Wyoming (WGFD 2005c, 2010a) and north of the Uncompahgre Plateau in Colorado (CPW 2010). The Project area is almost entirely within the known range of the Great Basin spadefoot. There are numerous known occurrences in the Project area in Wyoming and Colorado.

Greater Sandhill Crane (*Grus canadensis tabida*) – State: Wyoming, Colorado

A large, heavy-bodied, long-lived bird, the greater sandhill crane breeds on tundra, grasslands, and marshes (National Geographic Society 1999), in isolated bogs and marshes surrounded by shrub and forest habitat (Tacha et al. 1992). The species nests across large expanses of Siberia, Alaska, and northern Canada, but also in much smaller areas around the Great Lakes, Idaho/Wyoming border, northern Nevada, northwestern Colorado, Oregon, the southeastern United States, and Cuba (Tacha et al. 1992). Breeding does not occur until the birds reach 2 to 7 years of age, with both parents providing care of the young. Large flocks form during migration, composed of numerous pairs or family groups. The wintering range includes south-central California, southeastern Arizona, southern New Mexico, west and central Texas and scattered areas along the Gulf Coast, peninsular Florida, and northern Mexico (Tacha et al. 1992). Known occurrences in the vicinity of the Project area are located along the North Platte River, Little Snake River, Yampa River and in Routt National Forest. Only two confirmed occurrences are located in the Project area. These occurrences are located where Link C100 crosses the Yampa River approximately 11 miles east of Craig, Colorado. In addition to these known occurrences, greater sandhill cranes are likely to breed, forage, and migrate through the Project area.

Greater Short-horned Lizard (*Phrynosoma hernandesi*) – State: Wyoming

The greater short-horned lizard can be found from extreme southern Canada to southern Durango, Mexico, and from Nevada to western Nebraska. The species feeds primarily on ants, but will also eat other insects, snails, and spiders (Stebbins 2003). There are no known occurrences of the species in the Project area; however, the entire Project area falls within the range for the species.

Iowa Darter (*Etheostoma exile*) – State: Wyoming, Colorado

The Iowa darter inhabits clear to lightly turbid water in small cool lakes, bogs, ponds, and in slow-moving waters of small brooks to medium rivers. The species is known to occur throughout much of southern Canada and northern United States from New York to Montana and as far south as New Mexico (Fuller and Neilson 2012; WGFD 2010a). In the Project area, the Iowa darter is known to occur in the Yampa River between Dinosaur National Monument and Craig, Colorado. In Utah, the species is known from a single collection in the Green River near Jensen (Fuller and Neilson 2012). There are no known occurrences of the species in the Project area in Wyoming; however, the northeastern end of the Project area in Carbon County Wyoming lies within the known range of the Iowa darter in Wyoming (WGFD 2010a). The Iowa darter may occur in suitable aquatic habitats in the Project area.

Juniper Titmouse (*Baeolophus ridgwayi*) – State: Wyoming

The juniper titmouse is a year-round resident in western North America from southern Oregon west to Wyoming and south to Arizona, Sonora, and western Texas. Terrestrial habitats of this titmouse species include juniper woodlands, sagebrush and other mixed shrub woodlands, but require old-growth woodlands with open canopy and higher herbaceous ground cover. The juniper titmouse uses secondary cavities for nest, often using woodpecker holes or natural cavities (WGFD 2010a). The Project area is within the known range of the species and suitable habitat is known to occur near transmission line alternative routes in Utah, Wyoming, and Colorado. Ten occurrences of the juniper titmouse have been noted in the Project area along Links W492, W520, and W493 in southwestern Wyoming. The juniper titmouse is known to breed and forage in the Project area.

Kit Fox (*Vulpes macrotis*) – BLM: Colorado, Utah; State: Colorado, Utah

The kit fox is a desert adapted fox that is absent from high elevation montane regions. Populations are associated with sparsely vegetated arid habitat, primarily greasewood, shadscale, or sagebrush dominated habitat (Bosworth 2003). They are also found adjacent to irrigated crop land and urban fringes, and may use man-made structures for denning. Kit fox are primarily carnivorous and have adapted to obtain water requirements directly from prey, but have to consume prey over and above energetic requirements to do so. In addition, kit fox den during the day and have nocturnal movement patterns to minimize water loss and reduce heat loads (Cypher 2003). Kit fox populations occupy habitats that provide favorable combinations of low predator numbers, sufficient prey, and soils suitable for denning (UDWR 2011a). Home range size varies according to sex, food availability, season, and geographic location. Population density fluctuates according to food availability as a consequence of climatic conditions, namely drought. Further limiting factors include predation by coyotes (the primary source of mortality for kit fox), collisions with vehicles and accidental death through anthropogenic development (Cypher 2003). Increased availability of water in arid environments and introduction of invasive weeds are known to threaten kit fox populations by extending the distribution of competitors (coyotes) into kit fox habitat and altering the availability of prey species. Transmission line alternative routes are located within the known range of the species in Colorado and Utah and contain suitable habitat. The kit fox is known to occur throughout desert shrub and sagebrush communities near transmission line alternative routes.

Land Snails (combined account) – State: Wyoming

Land snails are found throughout North America. Approximately 1,000 land snails and slugs inhabit most terrestrial habitats across North America. These species feed on plants, litter, wood, and dead animals (WGFD 2010a). There are no known occurrences of these species in the Project area; however, that these species are found in most terrestrial habitats, potentially suitable habitat is likely present in the Project area.

Lark Bunting (*Calamospiza melanocorys*) – State: Wyoming

The breeding range of the lark bunting extends from southern Alberta and Saskatchewan south to northeastern New Mexico and the Texas Panhandle. The wintering range extends from central Texas west to Baja California and south to central Mexico. The species inhabits grasslands and shrub-steppe of high plains including agricultural areas. Lark buntings feed on small seeds, grain, insects, and arachnids (Shane 2000). There are three known occurrences in the Project area; all are located in Utah. The lark bunting is considered to be an abundant summer resident in Wyoming (WGFD 2010a). The lark bunting is likely to breed and forage in the Project area.

Lesser Scaup (*Aythya affinis*) – State: Wyoming

The breeding range of the lesser scaup extends from northern Alaska to Quebec and as far south as southern Wyoming. The wintering range covers the southern United States south to Honduras and along both coasts of the continental United States and portions of the central United States including Colorado. Lesser scaups often inhabit fresh to moderately brackish, seasonal and semi-permanent wetlands and lakes with emergent vegetation such as bulrush (*Scirpus* spp.), cattail (*Typha* spp.), and river bulrush (*Scirpus fluviatilis*). This duck dives to feed on aquatic invertebrates such as insects, crustaceans, and mollusks; however, the species may also eat seeds and vegetative portions of aquatic plants (Austin et al. 1998). The lesser scaup is known to migrate through the Project area and is likely to breed, forage, and nest in aquatic habitats in the Project area.

Lewis's Woodpecker (*Melanerpes lewis*) – BLM: Utah; State: Wyoming, Utah

The breeding distribution of Lewis's woodpecker is associated with the distribution of ponderosa pine, although the species is also known to use riparian and mountain shrub habitats. It is an open country bird, found most often where trees are scattered on woodland edges, streamside trees, and recently burned forests with a good under-story of grasses and shrubs to support insect prey populations. Nests are excavated in trunks or large branches of large, dead, or decaying trees, including burned trees (Tobalske 1997). The Project area is within the known range of the Lewis's woodpecker and the species is known to breed and forage in the vicinity of the Project area in Colorado, Utah, and Wyoming (Cervinski et al. 2004; Tobalske 1997). There are three known occurrences of the Lewis's woodpecker in the Project area. One is located where Link U402 crosses the Green River. The remaining two occurrences are located near the junction of Nebo Creek and Spencer Canyon along Link U625 between Uinta and Manti-La Sal National Forests.

Little Brown Myotis (*Myotis lucifugus*) – State: Wyoming

This small bat is abundant in forested areas. In the west, it is found primarily in higher elevations and riparian areas within forest habitats (Bat Conservation International 2009b; Bradley et al. 2006). Little brown myotis hibernates in caves, abandoned mines, and tunnels in the east; however, winter roosts in the west are not known. Day roosts include hollow trees, rock outcrops, caves, mines and buildings (Bradley et al. 2006). One of North America's most wide-ranging bats, the little brown myotis occurs from Alaska, across Canada to the Atlantic, across much of the United States, and down to central Mexico (Tuttle

2006). There are no known occurrences of little brown myotis within or near the Project area; however, the entire Project lies within the range of the species.

Loggerhead Shrike (*Lanius ludovicianus*) – BLM: Wyoming

The loggerhead shrike is a predatory passerine bird that hunts from perches and impales its prey on thorns and barbed wire fences. The species has a wide distribution and can be found throughout the United States. Habitat is open country with short vegetation, particularly pastures with fence lines (Yosef 1994), old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas, and open woodlands (Yosef 1996). Shrikes nest in a variety of trees and shrubs, where degree of cover is the most significant determinant. The loggerhead shrike often nests in trees with thorns (e.g., Russian olive or honey locust, *Gleditsia triacanthas*), possibly to provide increased protection (Porter et al. 1975). The loggerhead shrike breeds throughout the Project area and is a year-round resident of much of the Project area in Colorado and Utah (Yosef 1996). There are several known occurrences of the loggerhead shrike near transmission line alternative routes.

Long-billed Curlew (*Numenius americanus*) – BLM: Wyoming, Colorado, Utah; State: Wyoming, Colorado, Utah

The long-billed curlew is the largest North American shorebird, and a neotropical migrant. It is endemic to the Great Plains and winters in coastal/inland areas of the southern United States and Central America. It nests primarily in short-grass or mixed prairie habitat with flat to rolling topography but moves to taller grasses when brood rearing. It lives and breeds in higher and drier meadowlands than most other shorebird species (Parrish et al. 2002). The species commonly nests in cheatgrass (*Bromus tectorum*) dominated landscapes (Pampush and Anthony 1993) and agricultural fields in the Great Basin. The species is considered to be an uncommon summer resident in Wyoming (WGFD 2010a). The Project area is within the species' breeding range in Wyoming, Colorado, and Utah. The long-billed curlew has been observed near transmission line alternative routes near Hogback Lake southwest of Rawlins, Wyoming, along the Yampa River near Craig, Colorado, and in Duchesne and Juab counties in Utah. The long billed curlew is known to breed and forage in the Project area.

Long-eared Myotis (*Myotis evotis*) – BLM: Wyoming; State: Wyoming

The long-eared myotis is primarily associated with high elevation forests, but has also been found in other habitats ranging from lowland riparian and sagebrush to montane forest habitats. The species primarily roosts during the day in hollow trees, under exfoliating bark, crevices in small rock outcrops, and occasionally in mines, caves and buildings. Night roosts are caves, mines, and bridges. Long-eared myotis are believed to be non-migratory and hibernate during the colder months (Bradley et al. 2006). The species is widely distributed throughout the Project area. Transmission line alternative routes are located within the range of the species and contain suitable habitat. The long-eared myotis is likely to forage throughout the Project area.

Long-legged Myotis (*Myotis volans*) – State: Wyoming

Habitat for the long-legged myotis includes pinyon-juniper and Joshua tree woodland, montane coniferous forest, blackbrush, and sagebrush (Bradley et al. 2006). This bat hibernates in winter, but is capable of winter activity. Hibernacula are most likely mines or caves, while day roosts may be hollow trees, rock crevices, caves, mines, or buildings. Foraging is in open areas, with moths being the primary food source (Bradley et al. 2006). The majority of nursery colonies are found in trees of sufficient age (100 years or more) to provide crevices and exfoliating bark (Bat Conservation International 2009c). The long-legged myotis is one of the most widely distributed bats of the western United States (Bat Conservation International 2009c). There are no known occurrences of long-legged myotis within or

near the Project area; however, the entire Project area lies within the range of the species. Long-legged myotis are likely to forage near transmission line alternative routes.

Long-nosed Leopard Lizard (*Gambelia wislizenii*) – BLM: Colorado; State: Colorado

The long-nosed leopard lizard inhabits flat to gently sloping shrublands with scattered shrubs and other low plants. It is known to occur in Colorado and Utah. It is an uncommon species in Colorado, restricted to the west-central and southwest edge of the state (CPW 2010). The species is widespread and common in Utah. The southern portion of the Project area in Colorado and Utah is located within the known range and distribution of the species and contains habitat for the long-nosed leopard lizard. The long-nosed leopard lizard is known to occur in the Project area.

McCown's Longspur (*Calcarius mccownii*) – State: Wyoming

The McCown's longspur breeds from southern Alberta and Saskatchewan south to northern Colorado and western Nebraska. Its winter range is primarily in western Texas extending through very southern New Mexico south to northern Durango, Mexico. During both breeding and wintering seasons, the species inhabits open habitat with sparse vegetation such as shortgrass prairie, and semi-arid shortgrass steppe. These birds feed on the seeds of grasses and forbs, insects such as grasshoppers, moths, and beetles, and other arthropods (With 2010). There are no known occurrences of McCown's longspur in the Project area. The Project area is on the boundary of the species' range in Wyoming. The McCown's Longspur may occur in suitable habitats in the Project area in Wyoming.

Merlin (*Falco columbarius*) – State: Wyoming

The merlin is a raptor that occurs in Eurasia and North America from the northern tree limit in North America south to Washington, Oregon, Montana, Idaho, Wyoming, and the western border of North and South Dakota. In North America, the merlin winters from British Columbia and the Western and Southern United States south to Venezuela and Peru. Open woodlands, savannah, grasslands, and shrub-steppe below 8,500 feet (2,600 meters) are typical merlin habitat. Merlin typically nest in large ponderosa pines, in old domed magpie nests, and near open sagebrush-grassland for foraging. Nesting sites seem to be selected based on easy access, high vantage of the surrounding area, and maximum nest concealment (WGFD 2010a). Three relatively recent merlin occurrences (1983 to 2007) have been noted in the Project area: along Muddy Creek (Link W111), east of Hogback Lake, and along North Platte River (Link W30) (WYNDD 2011). The merlin is likely to breed and forage in the Project area.

Milk Snake (*Lampropeltis triangulum taylori*) – BLM: Colorado

The milk snake occurs in rocky thornscrub desert valleys, up through desert grasslands, into sagebrush desert, desert grassland, and open grassland in burrows of small mammals. Much of the Project area is located within the known range of the milk snake. There are numerous known occurrences of the species in the Project area throughout Utah.

Moose (*Alces alces*) – State: Wyoming

In Wyoming, moose are considered common as they occupy a variety of habitats including Engelmann spruce, Douglas and subalpine fir, and lodgepole pine forests along riparian communities where willows and shrubs are available as food resources. Moose tend to summer in higher elevation conifer forests and winter in willow and deciduous habitats. A portion of the Project area lies in the predicted moose range of southwestern Wyoming and northeastern Utah (WGFD 2010a). The species is likely to breed and forage in suitable habitat in the Project area. Refer to Section 3.2.7.4 for more detailed information about moose in the Project area.

Mountain Plover (*Charadrius montanus*) – BLM: Wyoming, Colorado, Utah; State: Wyoming, Colorado, Utah

The mountain plover was formerly a candidate to be listed as threatened under the ESA. On September 9, 2003 the FWS withdrew the listing because newly acquired information indicated that the threats to the species originally included in the proposal were not as significant as earlier believed (68 FR 53803). The mountain plover is associated with shortgrass prairie landscapes where the topography is fairly flat and the vegetation is sparse (Beidleman 2000), composed primarily of blue grama (*Bouteloua gracilis*) and buffalo grass (*Buchloe dactyloides*) (Parrish et al. 2002). Mountain plovers often breed near areas of excessive disturbance (Knopf and Miller 1994) and prairie dog colonies (Knowles and Stoner 1982). Mountain plovers migrate from their wintering grounds in the Central Valley of California and Mexico to breeding grounds in mid-March. Mountain plovers leave breeding grounds in August. Habitats used during wintering periods include plowed fields, heavily grazed annual grasslands, and burned fields (Knopf and Rupert 1995). In Wyoming, mountain plovers have been documented in every county and are known to breed in the Project area. In Colorado, populations are concentrated in and around the Pawnee and Comanche National Grasslands and in South Park, all outside of the Project area. The breeding population in Utah (Duchesne and Uintah counties) is in the Project area but has not been detected since 2002 and may have been extirpated (Bosworth 2003).

Mountain Sucker (*Catostomus platyrhynchus*) – BLM: Colorado; State: Colorado

The mountain sucker occurs throughout large portions of the western United States and Canada in smaller rivers and streams with a substrate of gravel, sand, and mud. It is typically found near undercut banks, eddies, small pools, and areas of moderate current. The Project area is within the southern portions of the species' range. Current known distribution includes the upper reaches of the White, Yampa, Green, and Colorado River Basins (Belica et al. 2006; CPW 2010). The mountain sucker is known to occupy streams and rivers in the Project area.

Mountain Whitefish (*Prosopium williamsoni*) – State: Wyoming

The mountain whitefish occurs in the Mackenzie River drainage and the Northwest Territories in Canada, south through western Canada, and northwestern United States in the Pacific, Hudson Bay, and upper Missouri River basins, to Truckee River drainage, Nevada, and as far southeast as Colorado and the Sevier River drainage in Utah. In riverine habitats, whitefish occur in creek, high gradient, medium river, pool, and riffle; and in lacustrine habitats, in deep and shallow water. Cold mountain lakes and fast, clear or silty streams with large pools; and streams with gravel riffles for spawning (NatureServe 2011). Two mountain whitefish occurrences have been noted in the Yampa River between the Project area and Hayden, Colorado. The mountain whitefish is known to occur in the Project area.

Northern Flying Squirrel (*Glaucomys sabrinus*) – State: Wyoming

The northern flying squirrel distribution ranges from Alaska through most of Canada, southward to the mountains of southern California, the southern Rocky Mountains, western South Dakota, the Great Lakes region, and the southern Appalachians. The species is considered uncommon in Wyoming as it is limited to western mountain ranges and isolated populations in the Black Hills and Sweetwater County in the state. The species prefers coniferous, deciduous, mixed, and riparian forests and woodlands. The northern flying squirrel often inhabits areas with sands of varying age, understory density and composition; however, old-growth forests near wetlands or streams are ideal for its gliding form of locomotion, cavity nesting, and use of wood fungi and lichens for food. A portion of the Project area lies on the extreme edge of the predicted northern flying squirrel range in southwestern Wyoming and central to northeastern Utah (WGFD 2010a). The species is likely to breed and forage in suitable habitat in the Project area.

Northern Goshawk (*Accipiter gentilis*) – BLM: Wyoming, Colorado, Utah; USFS: Ashley, Manti-La Sal, and Uinta National Forests; State: Wyoming, Utah

The northern goshawk is a large forest-dwelling raptor that inhabits old-growth forests in mountains and riparian zone habitats with a dense canopy (Daw and DeStefano 2001). Nests are typically in the largest trees, constructed of sticks just below the forest canopy (Speiser and Bosakowski 1987), and often occur in dead trees at elevations as low as 5,700 feet in Utah (Rodriguez 2012). The goshawk is partially migratory in the northern portion of its range where, in winters of food shortage, it migrates southward. In the Project area, the northern goshawk is found year-round in Wyoming and Utah. In Utah, it is an uncommon permanent resident found throughout the state in proper habitat, including montane conifer-aspen forests to the treeline (UDWR 1998). In Wyoming, it is found in both Sweetwater and Carbon counties in primarily coniferous forests, especially Douglas fir and lodgepole pine and aspen (Cervinski et al. 2004). All three national forests crossed by the Project contain suitable habitat for the species. Northern goshawk is managed as a management indicator species in all three forests.

Northern Leatherside Chub (*Lepidomeda copei*) – BLM: Wyoming, Utah; State: Wyoming

The northern leatherside chub is one of two taxa formerly known as leatherside chub that was recently split into two species based on genetic differences (WGFD 2010a). The northern leatherside chub occurs in streams and rivers of the northeastern Bonneville Basin in Utah, Wyoming, and Idaho. The species is not native to the Project area but introduced populations have been observed in the Colorado and Green River systems (UDWR 2009c). The species spawns over cobble and gravel substrate in the spring and is threatened by habitat loss and fragmentation and competition, hybridization, and predation by other fish. Populations of northern leatherside chub have been declining (WGFD 2010a). Transmission line alternative routes are located outside of the native range of the northern leatherside chub but introduced populations occur in the Project area.

Northern Leopard Frog (*Rana pipiens*) – BLM: Wyoming, Colorado; State: Wyoming, Colorado

The northern leopard frog occurs in wet meadows and the banks and shallows of marshes, ponds, lakes, reservoirs, streams, and irrigation ditches. In Wyoming, it inhabits the plains, foothills, and montane zones up to 8,500 feet (2,600 meters) (WGFD 2010a). In Colorado, the species occurs statewide in the mountains and lowlands (CPW 2010). Populations are known to be declining throughout the species range (WGFD 2010a). The Project area is located within the known range of the species and suitable habitats are present in Wyoming, Colorado, and Utah. There are numerous known occurrences of the species in the Project area throughout all three states. In Utah, centerlines cross known occurrences in Ashley Creek where it is crossed by Link U320, in Willow Creek south of Ouray where it is crossed by Link U400, and in the Green River where it is crossed by Link U490.

Northern Pintail (*Anas acuta*) – State: Wyoming

The northern pintail is found throughout most of North America from northern Alaska to Costa Rica. This duck typically nests in open country with shallow, seasonal, or intermittent wetlands and low vegetation. Outside of breeding season, the species can be found in most types of aquatic habitat. The species feeds on grains, moist-soil and aquatic plant seeds, pond weeds, aquatic insects, crustaceans, and snails (Austin and Miller 1995). There are no known occurrences in the Project area; however, the entire project is within the known range of the northern pintail.

Northern Plains Killifish (*Fundulus kansae*) – State: Wyoming

The northern plains killifish inhabits riverine systems in the Great Plains region of North America (WGFD 2010a). The species is not found in the Project area, but inhabits the Platte River system that may be affected from drawdown of water from the Platte River watershed as a result of project-related water usage.

Northern Tree Lizard (*Urosaurus ornatus wrighti*) – State: Wyoming

Distribution data for the northern tree lizard are not complete for the United States and Canadian providences (NatureServe 2012). The northern tree lizard occurs in southwestern Sweetwater County, in Wyoming where it is considered extremely rare. The species inhabits rocky cliffs, canyon walls, steep exposures of bedrock, and large boulders in sagebrush and juniper habitats. The northern tree lizard predares spiders and insects when active while basking in the sun most of the day, and perching in shaded areas in the hottest parts of the afternoon. A portion of the Project area lies within the range of the northern tree lizard in southwestern Wyoming (WGFD 2010a). The species is likely to breed and forage in suitable habitat in the Project area.

Olive-backed Pocket Mouse (*Perognathus fasciatus*) – State: Wyoming

Distribution of the olive-backed pocket mouse includes the northern Great Plains and Intermountain basins, from southern Alberta, Saskatchewan, and Manitoba south to northeastern Utah, southern Colorado and eastern South Dakota. A variety of arid and semiarid upland habitats, typically sparsely vegetated grasslands and sagebrush-grasslands are olive-backed pocket mouse habitat. This pocket mouse species occupies loose sandy to clay soils for burrowing (WGFD 2010a). The Project area is within the known range of the species and several occurrences of the olive-backed pocket mouse have been noted in the Project area. The olive-backed pocket mouse is likely to occur in suitable habitats throughout the Project area.

Oreohelix Mountain Snails (combined account) – State: Wyoming

Oreohelix mountain snails are land snails that live in the mountains in areas with canopy cover and leaf or needle litter. These snails are found in western North America from Saskatchewan and British Columbia to Mexico and California to South Dakota. Mountain snails feed on leaf litter, detritus, and microorganisms on solid surfaces (WGFD 2010a). There are no known occurrences of these species in the Project area; however, potentially suitable habitat may be present in the Project area.

Pale Milksnake (*Lampropeltis triangulum multistriata*) – State: Wyoming

Milksnakes are found in eastern and Midwestern North America, throughout Central America, and into northwest South America. The pale milksnake is the northernmost subspecies and is found in Montana, Wyoming, Colorado, Nebraska, and South Dakota west of the Missouri River to the Rocky Mountains. Milksnakes inhabit a wide variety of habitat types, but are primarily found in areas with a diverse grass-forb mixture with lower populations where woody vegetation dominated. Milksnakes feed on small vertebrates and eggs and kill by constricting their prey. The species is believed to be nocturnal (Smith and Stephens 2003). There are no known occurrences of pale milksnakes in the Project area; however, the northeastern end of the Project area lies within the known range of this subspecies (WGFD 2010a).

Pallid Bat (*Antrozous pallidus*) – State: Wyoming

Habitat for the pallid bat includes low desert, brushy terrain, coniferous forest and deciduous woodland. The species is found between 1380 to 8465 feet elevation in pinyon-juniper woodland, salt desert scrub, creosote, and sagebrush habitats (Bradley et al. 2006). The pallid bat hibernates in winter, but arouses

periodically to forage and drink. Day roosts include rock outcrops, mines, caves, hollow trees, buildings, and bridges. Unlike most other North American bats that capture prey in flight, the pallid bat primarily captures large ground-dwelling prey such as scorpions, centipedes, long-horned beetles, grasshoppers, and Jerusalem crickets (Bat Conservation International 2009d; Bradley et al. 2006). There are no known occurrences of pallid bats within or near the Project area; however, the entire Project area lies within the range of the species. The pallid bat is likely to forage in the Project area.

Peregrine Falcon (*Falco peregrinus anatum*) – BLM: Wyoming, Colorado; USFS: Ashley, Manti-La Sal, and Uinta National Forests; State: Wyoming, Colorado

The peregrine falcon was listed as an endangered species in 1970 under the Endangered Species Conservation Act of 1969, but after a successful recovery due to restrictions on the use of organochlorine pesticides, the species was delisted in 1999 (FWS 1999b) (64 FR 46543). The peregrine falcon is a widely distributed bird, occurring from the tundra to the tropics in a variety of different terrestrial biomes. The species most commonly occupies cliff habitats with open landscapes for foraging in close proximity to water (coasts, lakes, rivers, etc.), but also occurs in artificial habitats such as towers, buildings, and urban settings (White et al. 2002). The species feeds on other birds and is known to breed, forage, and migrate throughout the Project area.

Pill Clams (combined account) – State: Wyoming

Pill clams are mollusks found in almost all Wyoming waters. These clams inhabit fine substrates in cold to warm water that ranges from flowing to stagnant and even temporary. They can be found at elevations from lowlands to over 9,600 feet (2,900 meters) (WGFD 2010a). There are no known occurrences of the species in the Project area; however, given the omnipresence of these clams in Wyoming, potentially suitable habitat is likely present in the Project area.

Pinyon Mouse (*Peromyscus truei*) – State: Wyoming

The pinyon mouse distribution ranges from central Oregon, east to eastern Colorado and the panhandle of Texas, and south to southern Mexico. The pinyon mouse is considered rare in Wyoming as it likely limited to suitable habitat along Flaming Gorge Reservoir and isolated mesas of southern Sweetwater County of the state. The species occurs in stands of juniper grasslands and shrub-steppe where vegetation is not dense, often nesting in hollow junipers or rock crevices on rocky slopes. A portion of the Project area lies in the predicted pinyon mouse range in southwestern Wyoming, northwestern Colorado, and northeastern Utah (WGFD 2010a). The species is likely to breed and forage in suitable habitat in the Project area.

Plain Pocketbook (*Lampsilis cardium*) – State: Wyoming

The plain pocketbook inhabits river drainages including the Mississippi River drainage, St. Lawrence River, and Great Lakes region in the United States (WGFD 2010a). The species is not found in the Project area, but inhabits the Platte River system that may be affected from drawdown of water from the Platte River watershed as a result of project-related water usage.

Plains Black-headed Snake (*Tantilla nigriceps*) – State: Wyoming

The Plains black-headed snake is found from southeastern Wyoming to central Durango, Mexico and from Arizona to east-central Texas. The species inhabits plains and desert grassland, shrubland, and woodlands where it feed on invertebrates (Stebbins 2003). There are no known occurrences of the Plains black-headed snake in the Project area and the species was only recently discovered in Wyoming (WGFD

2010a). Portions of the Project area cross the potential range of the species in Wyoming (WGFD 2010b). The Plains black-headed snake may occur in the Project area.

Plains Orangethroat Darter (*Etheostoma spectabile*) – State: Wyoming

The Plains orangethroat darter inhabits riverine systems from central Texas to southern Wisconsin and Michigan with a western extent to eastern Wyoming. The species is not found in the Project area, but inhabits the Platte River system that may be affected from drawdown of water from the Platte River watershed as a result of project-related water usage.

Plains Topminnow (*Fundulus sciadicus*) – State: Wyoming

The Plains topminnow inhabits river systems in Nebraska, South Dakota, and eastern Wyoming and Colorado (Rahel and Thel 2004). The species is not found in the Project area, but inhabits the Platte River system that may be affected from drawdown of water from the Platte River watershed as a result of project-related water usage.

Pond Snails (combined account) – State: Wyoming

Pond snails (genus *Stagnicola*) are air-breathing freshwater snails that are found throughout northern North America. These snails feed on algae, microbes, fungi, and detritus on surfaces such as logs, macrophytes, rocks, and other substrates. Pond snails inhabit ponds or slow-moving streams (WGFD 2010a). There are no known occurrences of these species in the Project area; however, potentially suitable habitat may be present in the Project area.

Pygmy Nuthatch (*Sitta pygmaea*) – State: Wyoming

The pygmy nuthatch occurs in disjunct populations found throughout western North America. The pygmy nuthatch inhabits ponderosa and similar pine habitats, which results in the patchy distribution of these birds. The species primarily feeds on insects such as beetles, wasps, ants, true bugs, and caterpillars (Kingery and Ghalambor 2001). There are no known occurrences of pygmy nuthatch in the Project area; however, the Project area is within the known range of the species the pygmy nuthatch may be present where suitable habitat is located.

Pygmy Rabbit (*Brachylagus idahoensis*) – BLM: Wyoming, Utah; State: Wyoming, Utah

The pygmy rabbit is patchily distributed throughout the Great Basin and adjacent Intermountain areas including Utah, Wyoming, and Colorado. The species is restricted to areas having dense, tall stands of sagebrush and soil characteristics conducive to burrowing. The FWS has reviewed a petition to list the species range-wide, but found that listing of the pygmy rabbit was not warranted (75 FR 60516–60561). Pygmy rabbits are dependent on sagebrush, which composes up to 99 percent of its winter diet (WGFD 2010a). Because of this dependence, pygmy rabbits are susceptible to fragmentation and degradation of sagebrush habitats due to fire, agriculture, development, grazing, and other human land uses (UDWR 2011a). Transmission line alternative routes are located within the known range of the species and contain suitable habitat. In Wyoming, the species is likely to occur in the Project area in Carbon and Sweetwater counties. Pygmy rabbits have recently been identified in Moffat County in Colorado and may exist in sagebrush habitats crossed by the Project in other counties in the state as well as well (Estes-Zumpf and Rachlow 2009). Pygmy rabbits are not known to inhabit the Project area in Utah (Bosworth 2003).

Redhead (*Aythya americana*) – State: Wyoming

The redhead is found throughout most of the United States and Mexico as well as portions of Canada and Alaska. This duck inhabits almost any type of wetland from small, seasonal wetlands to larger semi-

permanent wetlands. Redheads feed on vegetative parts and tubers of submerged aquatic plants, muskgrass (*Chara* spp.), and aquatic invertebrates (Woodin and Michot 2002). The Project is in the species' range and redheads are likely to occur throughout the Project area where wetlands are present.

Ringed Crayfish (*Orconectes neglectus*) – State: Wyoming

The ringed crayfish inhabits river drainages from Nebraska to Oklahoma and Missouri to Wyoming (WGFD 2010a). The species is not found in the Project area, but inhabits the Platte River system that may be affected from drawdown of water from the Platte River watershed as a result of project-related water usage.

River Otter (*Lontra canadensis*) – State: Wyoming, Colorado

The river otter occurs throughout the United States and Canada. The species is primarily present in states bordering the Great Lakes, Atlantic Ocean and the Gulf of Mexico, and the forested regions of the Pacific coast in North America. Bog lakes with banked shores containing semi-aquatic mammal burrows and lakes with beaver lodges are typical river otter habitat. The otter usually avoids water systems with gradually sloping shorelines of sand or gravel, residing more commonly in lakes, streams, and aquatic areas in cottonwood riparian, riparian shrub, willow, and marsh-swamp land habitat. The river otter occurs in river systems crossed by or near the Project area including the Green, North Platte, Yampa, and Colorado river systems (Boyle 2006). The species appears to be recolonizing its former range in Wyoming (WGFD 2010a). River otter occurrences have also been noted near Flaming Gorge in the Project area.

Rocky Mountain Bighorn Sheep (*Ovis canadensis canadensis*) – USFS: Ashley and Uinta National Forests; State: Wyoming

The Rocky Mountain bighorn sheep distribution ranges from southwestern Canada, south through the Rocky Mountains, Sierra Nevada, and desert mountains of the southwestern United States to Baja California and the northwestern mainland of Mexico. A portion of the Project area lies in the range of the Rocky Mountain bighorn sheep in west central Wyoming (Beecham et al. 2007). The species is likely to breed and forage in suitable habitat in the Project area. Refer to Section 3.2.7.4 for more detailed information about Rocky Mountain bighorn sheep in the Project area.

Roundtail Chub (*Gila robusta*) – BLM: Wyoming, Colorado, Utah; State: Wyoming, Colorado, Utah

The roundtail chub is endemic to rivers and streams in the Colorado River drainage (Bosworth 2003). The species is threatened by fragmentation and loss of habitats and competition and predation by nonnative species. Roundtail chub currently occupy 45 percent of their historic range in the Colorado River Basin (WGFD 2010a). Current known distribution of the roundtail chub includes the Little Snake (Carbon County) and Green (Sweetwater County) River drainages in Wyoming (WGFD 2005a), the Little Snake and Green (Moffat County) and Colorado (Mesa County) River drainages in Colorado; and the Colorado River Drainage including the Colorado (Grand County), Green (Uintah, Emery, and Grand counties), and San Rafael (Emery County) rivers in Utah (UDWR 1998). Transmission line alternative routes are located in or cross the known range of the roundtail chub in Wyoming, Colorado, and Utah. The species is likely to be present in the Project area. One known occurrence is crossed by Link U400 where it crosses the White River.

Sage Sparrow (*Amphispiza belli*) – BLM: Wyoming; State: Wyoming

The sage sparrow prefers semi-open habitats with evenly spaced shrubs that are less than 6.5 feet high (Martin and Carlson 1998). The sage sparrow is typically considered big sagebrush (*Artemisia tridentata*)

obligate inhabiting pure stands as well as stands that are interspersed with bitterbrush, saltbush, shadscale, rabbitbrush, or greasewood. It is rarely found in mixed sagebrush-juniper (*Juniperus* spp.) except where it is adjacent to shrub-steppe habitat (Martin and Carlson 1998). Evidence suggests that sage sparrows abandon cheatgrass-dominated areas and areas where sagebrush has been removed (Martin and Carlson 1998). The sage sparrow is found throughout the Project area during the breeding season (Beason et al. 2008; Beason et al. 2005; Cerovski et al. 2004). The species is considered a common summer resident in Wyoming (WGFD 2010a). The species winters between central California, east to central New Mexico, and south to northwestern Mexico (WGFD 2010a). It is an uncommon permanent resident statewide and a common winter resident in southern Utah (Parrish et al. 2002). There are numerous known occurrences of the sage sparrow in the Project area in all three states and the species is known to breed and forage in the Project area.

Sage Thrasher (*Oreoscoptes montanus*) – BLM: Wyoming; State: Wyoming

The sage thrasher is a sagebrush obligate (Baker et al. 1976); however, the species is also noted to occur in black greasewood (*Sarcobatus vermiculatus*) and bitterbrush (*Purshia tridentata*) habitats (Reynolds et al. 1999). The sage thrasher is found throughout Wyoming, Colorado, and Utah in appropriate habitat during the breeding season (Cerovski et al. 2001). The species winters from central California, east to central Texas and south to central Mexico. The entire Project area lies in the breeding range of the species and suitable habitat is present. The species has been observed near transmission line alternative routes in Wyoming, particularly along Link W108. The sage thrasher is known to breed and forage in the Project area.

Short-eared Owl (*Asio flammeus*) – BLM: Utah; State: Wyoming, Utah

Short-eared owls can be found in all open environments in North America, especially in lowland areas where there is a higher density of low vegetation and rodents. They occur in native grasslands, extensive grassy areas of broad lowland floodplains, marshes and wet hummocks, and agricultural areas. The species also frequent areas intermixed with brush and woodland, provided there is ample open grassland to hunt. Short-eared owls tend to be found in the densest stands of grass (Glinski 1998b). They nest on the ground, sometimes in small colonies (Terres 1980). Short-eared owls eat mainly rodents, especially meadow mice, but also shrews, cotton rats, rabbits, pocket gophers, and bats. They also eat insects such as grasshoppers, June beetles, and cutworms in addition to small birds. The Project area is in the known range of these species and suitable breeding and foraging habitats are present. The short-eared owl is likely to breed and forage near transmission line alternative routes in Wyoming, Colorado, and Utah.

Smooth Greensnake (*Opheodrys vernalis*) – BLM: Utah; State: Wyoming, Utah

The smooth greensnake inhabits prairies, meadows, marshes, stream edges, and grassy upland areas. The species is rarely seen far from riparian areas (WGFD 2010a). In Utah, the smooth greensnake occurs in scattered localities in the mountains of central and eastern Utah (Bosworth 2003). The Project area is located in the known range of the smooth greensnake in Colorado, Utah, and Wyoming (Redder et al. 2006). Populations of the species in the Project area are geographically isolated from larger populations in the eastern United States (Redder et al. 2006). Suitable habitat for the smooth greensnake occurs in the Project area in Utah and Colorado and the species has been observed in the Red Narrows along Link U460 between the Uinta and Manti-La Sal National Forests. The smooth greensnake is known to occur in the Project area.

Snowy Egret (*Egretta thula*) – State: Wyoming

The snowy egret is primarily found along the coastal regions of the United States and throughout Mexico. However, there is an area of suitable breeding habitat found in northern Nevada and Utah into

southwestern Wyoming and a disjunct area in southeast Wyoming. In these interior areas, the species tends to inhabit willows along large rivers, reservoirs, grassy marshes, and wet meadows. The species primarily feeds on invertebrates, but will also feed on fish, frogs, toads, snakes, and lizards (Parsons and Master 2000). No known occurrences of snowy egret are located in the Project area; however, the species may be found breeding or foraging along waterways in the northern portion of the Project.

Southern Bonneville Springsnail (*Pyrquolopsis transversa*) – State: Utah

The southern Bonneville springsnail is a Utah endemic that is known to currently occur in six freshwater springs in central Utah, including four localities in Tooele County and one each in Utah County and Sanpete County. The species is found in aquatic habitats produced by springs in a wide elevation range from 5,830 to 6,740 feet (UDWR 2010a). One known Southern Bonneville springsnail population exists in the Project area in Thistle Creek along U.S. Highway 89 south of Thistle, Utah (Link U625).

Southern Leatherside Chub (*Lepidomeda aliciae*) – BLM: Utah; USFS: Manti-La Sal and Uinta National Forests; State: Utah

The southern leatherside chub is one of two taxa formerly known as leatherside chub that was recently split into two species based on genetic differences (Johnson et al. 2004). The southern leatherside chub is a small minnow native to streams and rivers of the southeastern portion of the Bonneville Basin. Observations of introduced leatherside chub populations have been found in the Strawberry, Green, and Freemont rivers in the Upper Colorado River Basin (UDWR 2010b). In Utah, the current known distribution includes Utah Lake and the Sevier River drainage (UDWR 2010b). Transmission line alternative routes are located in the known range of the southern leatherside chub in Utah and contain suitable habitat. The species is known to occur in the Project area.

Spotted Bat (*Euderma maculatum*) – BLM: Wyoming, Utah; USFS: Ashley, Manti-La Sal, and Uinta National Forests; State: Wyoming, Utah

The spotted bat roosts in crevices on cliff walls and forages in open grassland, desert shrub, sagebrush, and mountain meadow communities (Bosworth 2003). The habitat is patchy and depends on the availability of cliff roosting habitat. It does not appear to migrate, but hibernates locally during winters (Bradley et al. 2006). The spotted bat is widely distributed throughout the Project area. The Project area is located in the range of the species and contains suitable habitat; the spotted bat is likely to forage near transmission line alternative routes in Wyoming, Colorado, and Utah. All three national forests contain suitable habitat for the species.

Stonecat (*Noturus flavus*) – State: Colorado

The stonecat inhabits riverine systems throughout much of the northern United States from Montana and Wyoming east to Vermont (Florida Museum of Natural History 2012). The species is not found in the Project area, but inhabits the Platte River system that may be affected from drawdown of water from the Platte River watershed as a result of project-related water usage.

Suckermouth Minnow (*Phenacobius mirabilis*) – State: Wyoming, Colorado

The suckermouth minnow inhabits river drainages throughout the Mississippi River Basin from Ohio to Wyoming in isolated populations also present in the Gulf Coast drainage (WGFD 2010a). The species is not found in the Project area, but inhabits the Platte River system that may be affected from drawdown of water from the Platte River watershed as a result of project-related water usage.

Swainson's Hawk (*Buteo swainsoni*) – State: Wyoming

Swainson's hawk is widely distributed in the summer in the western United States. It is generally found in savannas, prairies, deserts, open pine-oak woodlands, and agricultural areas (Ehrlich et al. 1988). Grass-lined nests of large sticks and twigs are usually built in large trees, but may occasionally be located on cliffs (Ehrlich et al. 1988). Swainson's hawks feed on small mammals, snakes, lizards, and large insects (Ehrlich et al. 1988). At least one threat to the species is the shooting of birds perched along roadsides, but they are also susceptible to pesticides on their wintering grounds in Argentina (Ehrlich et al. 1992; Glinski and Hall 1998). The entire Project area lies in the breeding range for the species. There are two known nest sites near transmission line alternative routes in Utah. One is located in Grand Valley along Link U490 and the other is located between Mona and Nephi along Link U650. The Swainson's hawk is known to breed and forage in the Project area in Colorado, Utah, and Wyoming.

Three-toed Woodpecker (*Picoides dorsalis*) – BLM: Utah; USFS: Ashley, Manti-La Sal, and Uinta National Forests; State: Utah, Wyoming

The three-toed woodpecker inhabits boreal and montane coniferous forests, generally above 8,000 feet (2400 meters) in elevation (Parrish et al. 2002). Typical nesting trees include alpine fir, Engelmann spruce, blue spruce, and white fir; wintering habitat also includes aspen forest (UDWR 1998). Three-toed woodpeckers are closely associated with infestations of spruce beetles (*Dendroctonus rufipennis*) and other scolytid beetles. This food source is particularly abundant after fires because it attacks trees that have been weakened or killed. Following the increased food supply, three-toed woodpeckers can be common at burn sites (Murphy and Lehnausen 1998). The three-toed woodpecker nests in the trunks of coniferous and deciduous snags and trees and shows a preference for trees with heartrot (Leonard 2001). It is primarily a resident throughout its breeding range, but often migrates elevationally throughout the year. The species can be found in Wyoming, Colorado, and Utah; however, it is only present in the Project area in Wyoming and Utah. In Wyoming, the species is an uncommon year-round resident of coniferous forests (Cеровski et al. 2001). In Utah, the three-toed woodpecker is a permanent resident of the high-elevation plateaus in the south-central portion of the state, including Manti-La Sal National Forest (Bosworth 2003). The species is a management indicator species on the Uinta National Forest. Much of the Project area lies in the known range of the species and the American three-toed woodpecker is likely to breed and forage in the Project area. One known occurrence is crossed by Link U600 along Utah Highway 31 in Cottonwood Canyon east of Fairview.

Townsend's Big-eared Bat (*Corynorhinus townsendii*) – BLM: Wyoming, Colorado, Utah; USFS: Ashley, Manti-La Sal, and Uinta National Forests; State: Wyoming, Colorado, Utah

The Townsend's big-eared bat is a relatively common species that roosts in caves and abandoned mines and forages in sagebrush, pinyon-juniper, mountain shrub, and mixed conifer communities. It is highly associated with the availability of caves and mines. The Townsend's big-eared bat does not appear to migrate through much of its range, but hibernates locally during winters (Oliver 2000). It is widely distributed throughout the Project area. Transmission line alternative routes are located in the range of the species and contain suitable habitat. Townsend's big-eared bat is likely to forage in portions of the Project area in Wyoming, Colorado, and Utah.

Trumpeter Swan (*Cygnus buccinator*) – BLM: Wyoming; State: Wyoming

The trumpeter swan is the largest native North American waterfowl. Breeding habitat includes freshwater marshes, ponds, lakes, and occasionally rivers (Hansen et al. 1971). Nests are typically built in emergent vegetation, with surrounding water less than 36 inches deep, but are also found on muskrat structures or house islands with low human disturbance. Nests require approximately 330 feet of open water for takeoff and close proximity to large invertebrate populations. Most flocks of trumpeter swans are year-round

residents, only migrating short distances to ice-free waters (Mitchell 2010). The trumpeter swan is primarily found in western Canada and Alaska, but localized populations occur throughout the Intermountain and Rocky Mountain regions, including Wyoming. The Project area is in the known range of the trumpeter swan and potential habitat for the species occurs throughout the Project area. However, trumpeter swans are not known to occur in or in the vicinity of transmission line alternative routes. Transient trumpeter swans may occur in the Project area.

Vagrant Shrew (*Sorex vagrans*) – State: Wyoming

The vagrant shrew occurs from southern British Columbia and Alberta south to central Nevada with an isolated population in central Mexico. The species is considered rare in Wyoming because populations are limited in numbers due to dependence on vulnerable riparian habitat and ongoing loss of habitat. The vagrant shrew prefers areas with moist soil, leaf litter accumulation, and/or rotting logs in a variety of habitats including riparian shrub, meadow grassland, bog, and conifer forest. A portion of the Project area lies in the predicted vagrant shrew range in southwestern Wyoming (WGFD 2010a).

Virginia Rail (*Rallus limicola*) – State: Wyoming

The Virginia rail is found throughout much of the United States and northern Mexico, excluding the interior southeastern United States. The species breed primarily in freshwater wetlands, but may utilize salt marshes as well. Typically habitat contains shallow water with emergent cover and substrate with a high invertebrate abundance. Virginia rails' primarily feed on small invertebrates and a variety of aquatic plants and seeds of emergent plants (Conway 1995). There are no known occurrences of Virginia rail located in the Project area; however, the entire Project area is located in the known range of the species. The Virginia rail is likely to breed and forage in suitable wetland habitats in the Project area.

Western Red Bat (*Lasiurus blossevillei*) – BLM: Utah; State: Utah

The western red bat roosts in trees and foliage in low elevation, riparian cottonwood forests. The species is migratory and spends winters outside of the Project area. In Utah, historical records indicate the presence of the species in Washington County, but none have been observed since the 1950s, which is believed to correlate with the replacement of cottonwoods with tamarisk (*Tamarix* spp.). The western red bat is very rare in Utah, but is known to occur in Washington, Carbon, and Utah counties (Bosworth 2003). Some transmission line alternative routes are located in the summer range of the species in Utah and contain suitable habitat. The western red bat is very rare, but could potentially forage near transmission line alternative routes in Utah.

Western Scrub Jay (*Apelocoma californica*) – State: Wyoming

The western scrub jay is found throughout the Intermountain west, much of California, and parts of Mexico and Texas. As its name implies, the western scrub jay inhabits scrub habitat such as oak, pinyon-juniper, brush, and chaparral as well as orchards and riparian woodland. Western scrub jays are omnivorous feeding on a mix of arthropods, fruit, and seeds depending on the time of year (Curry et al. 2002). The Project area is in the known range of the Western scrub jay and the species is likely to breed and forage in suitable habitats in the Project area.

Western Small-footed Myotis (*Myotis ciliolabrum*) – State: Wyoming

The western small-footed myotis uses a variety of habitats, from desert scrub, grassland, and sagebrush, to pinyon-juniper woodland, pine-fir forests, and urban and agricultural areas. The species hibernates during the colder months, either individually or in colonies. As with many other bats, the western small-footed myotis roosts in caves, mines, and trees. It forages in open areas, searching for small moths, flies,

ants, and beetles (Bradley et al. 2006). The range of the western small-footed myotis extends from western Canada, through the western United States, and into central Mexico (Bat Conservation International 2009e). There are no known occurrences of western small-footed myotis in or near the Project area; however, the entire Project lies in the range of the species. Western small-footed myotis are likely to forage near transmission line alternative routes.

Western Snowy Plover (*Charadrius alexandrinus nivosus*) – BLM: Colorado, Utah; State: Colorado

Inland western snowy plovers breed on flat, unbroken, barren to sparsely vegetated ground at alkaline/saline lakes, reservoirs, and ponds; riverine sand bars; and occasionally at man-made structures such as sewage plants, salt-evaporators, and agricultural waste-water ponds. The species winters along the Pacific coast and Gulf of California (Page et al. 1995). Nests are generally located near a conspicuous feature (Page et al. 1985), kelp, driftwood, clam shell, cow dropping, or tumbleweed on a barren landscape. Nests are simple scraped depressions on dry ground and lined with small debris located (Page et al. 1995) within 500 feet of water (Beidleman 2000). Though the snowy plover is present in Wyoming, Colorado, and Utah, in the Project area, the species is only documented from the Flaming Gorge area of Wyoming. There is suitable habitat available throughout the Utah portion of the Project area and migrants may occasionally pass through transmission line alternative routes.

Western Spiny Softshell (*Apalone spinifera hartwegi*) – State: Wyoming

The western spiny softshell is a subspecies of the spiny softshell turtles that are found throughout much of the eastern and central United States. This subspecies is found west of the Mississippi River to Montana and south to Oklahoma. Spiny softshell turtle inhabit rivers with quiet water and a bottom of mud, sand, or gravel. They can also be found in ponds, canals, and irrigation ditches with permanent water (Stebbins 2003). There are no known occurrences of the western spiny softshell in the Project area; however, the extreme northeastern end of the Project area lies in the predicted range of the species according to the Wyoming State Wildlife Action Plan (WGFD 2010a). The Western spiny softshell may occur in the Project area in suitable aquatic habitats in Carbon County, Wyoming.

White-faced Ibis (*Plegadis chihi*) – BLM: Wyoming, Colorado; State: Wyoming

Great Basin populations of white-faced ibis typically nest in stands of hardstem bulrush (*Scirpus acutus*), Olney's bulrush (*S. olneyi*), and alkali bulrush (*S. paludosus*). Colorado populations are found in cattail and giant burreed (*Sparganium eurycarpum*). Foraging areas include adjacent flooded wetlands with short emergent plants (sedges, spikerushes, saltgrass, and greasewood) (Ryder and Manry 1994). The white-faced ibis has also been observed feeding in nearby irrigated crops, particularly alfalfa, in the Great Basin Valley (Bray and Klebenow 1988). The white-faced ibis winters in the southern United States into Central and South America (UDWR 2000). In Wyoming, Colorado, and Utah, the species is locally distributed and moves frequently in response drought and rain. Utah's Great Salt Lake is believed to be the largest breeding colony in the world. In the Project area, breeding has been confirmed in Carbon County, Wyoming (Cerovski et al. 2004); important areas in Colorado during migration include Browns Park National Wildlife Refuge (Little Snake BLM Field Office) and Six and Fifty Reservoir near Mack (BLM Grand Junction Field Office) and potential habitat is present throughout Utah (UDWR 2000). White-faced ibis may occur in the Project area as incidental migrants, but are not likely to breed in the Project area.

White-tailed Prairie Dog (*Cynomys leucurus*) – BLM: Wyoming, Colorado, Utah; State: Utah

The white-tailed prairie dog occurs from south central Montana south to northeastern Utah and western Colorado in arid grasslands and shrub/grassland habitats with less than 12 to 15 percent slopes. The

species is found in intermountain valleys, benches, and plateaus with diverse grass and forb cover (WGFD 2005b). White-tailed prairie dog populations are highly dynamic; however, abundance has greatly decreased since information has been recorded, likely due to changes in wildfire frequency, resource extraction, grazing, disease, predation, and fluctuation in availability of forage (Keinath 2004). Large complexes of white-tailed prairie dogs in Wyoming and northwest Colorado account for between 50 and 75 percent of all white-tailed prairie dogs (Keinath 2004). A large portion of the Project area east of the Wasatch Mountains is located in the range of the species. Numerous prairie dog colonies are located near transmission line alternative routes throughout Utah, Wyoming, and Colorado.

Willow Flycatcher (*Empidonax traillii*) – State: Wyoming

Willow flycatchers breed throughout much of the northern and southwestern United States. There are four or five subspecies that are generally accepted. The southwestern willow flycatcher (*Empidonax traillii extimus*) is discussed in Section E.6.2.1 as it is listed as endangered under the ESA. Willow flycatchers inhabit moist, shrubby areas typically with standing or running water. They primarily feed on insects through aerial capture by hawking or hover-gleaning (Sedgwick 2000). The majority of the Project area lies in the breeding range of the willow flycatcher; however, no known occurrences are located in the Project area. The willow flycatcher may breed and forage in suitable habitats in the Project area.

Wood Frog (*Rana sylvatica*) – State: Wyoming, Colorado

Wood frogs are found from Alaska to Nova Scotia and as far south as Georgia and Alabama, but inhabit very little of the western United States. Disjunct populations are found in southern Wyoming in the Medicine Bow Mountains (Carbon and Albany counties) and in the Bighorn Mountains in northern Wyoming west of Sheridan. Wood frogs inhabit damp and shady woods and forests near clear streams and leafy pools. In colder climates, they may inhabit ponds in open grassy areas bordered by thickets of willow and aspen (Stebbins 2003). There are no known occurrences in the Project area; however, the Project area (Link W18) skirts the edge of the predicted range of the population in the Medicine Bow Mountains in Wyoming (WGFD 2010a). The wood frog may occur in suitable habitats in the Project area.

Wyoming Pocket Gopher (*Thomomys clusius*) – BLM: Wyoming; State: Wyoming

The Wyoming pocket gopher is primarily solitary, with limited distribution. Abundance and population trends of Wyoming pocket gopher populations are unknown due to limited data. Little is known about the Wyoming pocket gopher, but habitat appears to be dry, gravelly, shallow-soil ridge tops in greasewood communities. The species has been found on edges of eroding washes. Wyoming pocket gopher typically occurs on sites with 50 to 80 percent bare ground, little to no grass or litter cover, and where Wyoming big sagebrush is absent (WGFD 2010a). It is highly fossorial, living in underground burrow systems and tunnels (Keinath and Beauvais 2006). It is the only mammal that occurs exclusively in Wyoming where it is known from southeastern Sweetwater County and southwestern Carbon County (WGFD 2010a). Population integrity is directly linked to habitat quality, and local populations are potentially sensitive to habitat disturbance. Diet includes roots, tubers and surface vegetation, and the species is active throughout the year. Pocket gophers are ecologically important as prey items and influence soils, microtopography, habitat heterogeneity, and plant species diversity (NatureServe 2012). Transmission line alternative routes are located in the known range of the Wyoming pocket gopher and contain suitable habitat in Sweetwater and Carbon counties, Wyoming. The Wyoming pocket gopher is likely to occur near transmission line alternative routes.

E.6.2.3 U.S. Forest Service Management Indicator Species

This section includes species accounts for USFS MIS that are not USFS sensitive or assigned another status by federal agencies or states and were carried forward for detailed analysis. Species accounts for

USFS MIS that are also USFS sensitive species or assigned another status by federal agencies or states are included in Sections E.6.2.1 and E.6.2.2.

American Beaver (*Castor canadensis*) – USFS: Uinta National Forest

The American beaver's distribution extends throughout North America except the arctic tundra, peninsular Florida, and much of the desert area of the Southwest, including parts of the northern edge of Mexico. Beavers inhabit permanent water sources and prefer low gradient streams, ponds, and small mud-bottomed lakes with damnable outlets. They occur in artificial ponds, reservoirs, and canals where food is available. Deciduous tree and shrub communities are typical habitats for the American beaver (Anderson 2002). Given the wide distribution of American beaver they are likely to occur in the Project area.

Elk (*Cervus elaphus*) – USFS: Ashley and Manti-La Sal National Forests

Elk were historically widespread in Canada and the United States, now they are mostly restricted to the western states. Elk habitat use varies according to location, as they use areas such as alpine pastures, marshy meadows, river flats, and aspen parkland, as well as coniferous forests, brushy clear cuts or forest edges, and semi-desert. In mountainous regions, elk spend summers in alpine meadows and winters in valleys. On more level terrain, elk seek wooded hillsides in summers and open grasslands in winters (Senseman 2002). Refer to Section 3.2.7.4 for more detailed information about elk in the Project area.

Golden Eagle (*Aquila chrysaetos*) – USFS: Ashley and Manti-La Sal National Forests

Golden eagles are widely distributed in the western United States and can be found in a variety of habitats. For hunting, the species prefers open ground or low hills where visibility is good (Ehrlich et al. 1988; Glinski 1998a). Golden eagles nest most commonly on cliffs, but are also known to nest in trees and manmade structures such as telephone poles (Glinski 1998a). Nests from previous years are frequently reused. The species form strong pair bonds, frequently remaining with the same mate for several years, if not life. The golden eagle feeds primarily on mammals, but also will feed on snakes, birds, and large insects when mammals are unavailable (Ehrlich et al. 1988; Glinski 1998a; Terres 1980). The golden eagle is a year round resident of the Project area and there are numerous known occurrences including nest sites near transmission line alternative routes.

Lincoln's Sparrow (*Melospiza lincolni*) – USFS: Ashley National Forest

The Lincoln's sparrow is relatively common in the western United States with a breeding range from western and central Alaska across Canada through northern Saskatchewan to Labrador, south to southern California, southwestern United States, southern Alberta, central Saskatchewan, central Michigan, New England, and Nova Scotia. A non-breeding range exists in the southern United States and move south regularly to Honduras, to central Panama; and the West Indies. Terrestrial habitats of the Lincoln's sparrow include herbaceous grassland, old field, chaparral/shrubland, and conifer woodland. Bogs, wet meadows, riparian thickets, shrubby forest edge, marshes, brushy fields and jack plain barrens are all suitable habitats mostly in northern and montane areas. Lincoln's sparrow nests are found on the ground in areas with concealing vegetation or in low shrubs (NatureServe 2011). Due to the wide distribution of the Lincoln's sparrow, it is likely to occur in the Project area.

Macroinvertebrates (aquatic) – USFS: Ashley and Manti-La Sal National Forests

The term macroinvertebrates encompasses a wide variety of benthic organisms. The group includes aquatic insects such as mayflies, caddis flies, daphnia, cyclops, and stoneflies), mollusks, and worms (Smith 2008). These species serve a food for much of the vertebrate life inhabiting the rivers and lakes of the national forests. Aquatic macroinvertebrates are considered a MIS for both the Ashley and Manti-La

Sal National Forests. Macroinvertebrates inhabit all waterways that may be crossed transmission line alternative routes.

Mule Deer (*Odocoileus hemionus*) – USFS: Ashley and Manti-La Sal National Forests

Mule deer occur across most of North America west of the 100 meridian from 23 to 60 degrees north. Mule deer occupy a variety of habitat types in mountains and lowlands, including forests, woodlands, forest edges, shrublands, grasslands with shrubs, and residential areas. Regions with successional vegetation, near agricultural lands are preferred habitat. In winter, mule deer can be found on warmer slopes and areas with minimal snow accumulation (Andersen and Wallmo 1984). Refer to Section 3.2.7.4 for more detailed information about mule deer in the Project area.

Red-naped Sapsucker (*Sphyrapicus nuchalis*) – USFS: Ashley National Forest

As with other sapsuckers, the red-naped sapsucker drills parallel rows of holes (sap wells) into the phloem and xylem of conifers and quaking aspens (*Populus tremuloides*) (Walters et al. 2002). This small woodpecker is a keystone forest species: its abandoned nest holes are used by mountain bluebirds (*Sialia currucoides*), northern saw-whet owls (*Aegolius acadicus*), and northern flying squirrels (*Glaucomys sabrinus*). A variety of insects and other bird species use its sap wells, either for the sap itself or to feed on the insects drawn to the sap (Floyd et al. 2007; Walters et al. 2002). The rufous hummingbird (*Selasphorus rufus*) is closely associated with the red-naped sapsucker, often nesting near the woodpecker's sap wells, a ready food source (Floyd et al. 2007). The red-naped sapsucker is a MIS for Ashley National Forest. No occurrences of the species are known in or in the vicinity of the Project area.

Song Sparrow (*Melospiza melodia*) – USFS: Ashley National Forest

The song sparrow has a vast breeding range extending throughout North America. Terrestrial habitats of the song sparrow include grassland, old field, shrubland, suburban and orchard, and woodlands; brushy, shrubby, and deep grassy areas along water systems and seacoasts; and marshes (cattail, bulrush, and salt) and are mostly in the northern and eastern portions of the song sparrow's range. Forest edge, bogs, brushy clearings, thickets, hedgerows, and gardens are all typical habitat type (Arcese et al. 2002). The song sparrow is likely to occur along waterways in the Project area.

Warbling Vireo (*Vireo gilvus*) – USFS: Ashley National Forest

The warbling vireo's distribution range extends from British Columbia across the vast majority of the United States excluding Georgia, Florida, and South Carolina, wintering from northern Mexico to Nicaragua. Terrestrial habitat of the warbling vireo includes hardwood forest, mixed forest, savanna, suburban and orchard areas, hardwood woodland, and mixed woodland. During migration periods, open deciduous and mixed deciduous-coniferous woodland, riparian forest and thickets, pine-oak association, orchards, and parks are suitable warbling vireo habitat. In winter, a wide variety of forest, woodland and scrub habitats are utilized (Gardali and Ballard 2000). Given the wide and diverse habitat distribution of the warbling vireo, it is likely to occur in the Project area.

E.7 Seasonal Restrictions for Special Status Plants

Seasonal restrictions to protect special status plants and their pollinators are not typically identified in BLM RMPs or USFS LRMPs. However, the FWS Draft Energy Development Management Guidelines for *Sclerocactus wetlandicus* and *Sclerocactus brevispinus* Core Conservation Areas identifies the following seasonal restriction recommendation in Level 1 *Sclerocactus* Core Conservation Areas:

- Ground-disturbing activities would occur outside of the flowering season, typically late April to mid-May, in *Sclerocactus* core habitat, as defined by the FWS, to avoid adverse impacts on *Sclerocactus* reproductive success related to fugitive dust and pollinator disturbance.

Any seasonal restrictions intended to reduce potential effects on plant species listed under the ESA would be consistent with the conservation measures developed during Section 7 consultation between BLM and FWS.

E.8 Seasonal Restrictions for Wildlife

Seasonal restrictions to protect wildlife are identified in BLM RMPs, USFS LRMPs, state wildlife management plans, and in agency guidelines relevant to the Project area and are described in Selective Mitigation Measure 12 (Section 3.2.7.4.3). Table E-11 summarizes relevant seasonal wildlife restrictions from applicable plans, sometimes with overlapping jurisdiction, by combining the earliest and latest dates identified for each species by applicable agency plans in each state. These dates represent the maximum length that restrictions would be necessary to provide adequate protections to wildlife during sensitive periods and comply with applicable plans and management recommendations. Seasonal restrictions for nesting raptors (Tables E-12 to E-14) were adopted from statewide plans and BLM RMPs. Seasonal restrictions and survey requirements for migratory birds are described in Design Feature 6 and Design Feature 7 (Section 3.2.8.4).

TABLE E-11 SEASONAL RESTRICTIONS IN SENSITIVE HABITATS				
Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
Soils				
Bureau of Land Management (BLM)	Moab Field Office Resource Management Plan (RMP)	For slopes greater than 30 percent in the Bookcliffs	BLM approved ground-disturbing activities are not allowed from November 1 to April 30. This restriction includes heavy equipment traffic on existing roads associated with drilling operations.	Exception: An exception could be granted if the operator can provide a plan of development demonstrating that the proposed action would be properly designed and constructed to support the anticipated types and levels of use. Roads must be designed to meet BLM road standards for drainage control and surfaced to support heavy equipment and tractor trailers. Adjustments to the timing restriction could be considered by the Field Manager on a case-by-case basis, depending on current soil and weather conditions. Modification: None Waiver: None
BLM	Moab Field Office RMP	Saline soils in the Mancos Shale	No ground-disturbing activities are allowed during the period from December 1 to May 31. This restriction includes heavy equipment traffic on existing roads associated with drilling operations.	Exception: An exception could be granted if the operator can provide a plan of development demonstrating that the proposed action would be properly designed and constructed to support the anticipated types and levels of use. Roads must be designed to meet BLM road standards for drainage control and surfaced to support heavy equipment and tractor trailers. Adjustments to the timing restriction could be considered by the Field Manager on a case-by-case basis, depending on current soil and weather conditions. Modification: None Waiver: None
Special Status Plants				
Jones' Cycladenia				
BLM	Moab Field Office RMP	Within 300 feet of plants and suitable habitat	Preclude construction activities from May 15 through June 30 in occupied habitat.	None

TABLE E-11 SEASONAL RESTRICTIONS IN SENSITIVE HABITATS				
Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
Special Status Wildlife				
Colorado River Fishes				
BLM	Little Snake Field Office RMP	All new pipelines and other controlled surface uses crossing any critical or occupied habitat of the Colorado River fishes	No work in the active river channel will take place between July 1 and September 30 to prevent adverse effects from sedimentation during spawning; also, no work will take place when larval fishes are drifting in the river channel.	None
Columbian Sharp-tailed Grouse				
BLM	Rawlins Field Office RMP	Within 0.25 mile of perimeter of occupied Colombian sharp-tailed grouse leks	Disruptive activities are prohibited between 6:00 p.m. and 9:00 a.m. from March 1 to May 20	Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.
BLM	Rawlins Field Office RMP	In suitable sharp-tailed grouse nesting and early brood rearing habitat, and within 1 mile of the perimeter of a sharp-tailed grouse lek, or in identified sharp-tailed grouse nesting and early brood rearing habitat	Avoid ground-disturbing and disruptive activities, geophysical surveys, and organized recreational activities (events) that require a special use permit from March 1 to July 15.	Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.
BLM	Rawlins Field Office RMP	Delineated sharp-tailed grouse winter concentration areas	Ground-disturbing and disruptive activities are prohibited during the period of November 15 to March 14 for the protection of sharp-tailed grouse winter concentration areas.	Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.
BLM	Little Snake Field Office RMP	Within a 0.25 mile radius of a lek site, in mapped Colorado Parks and Wildlife habitat	Nesting habitat will be closed to ground-disturbing activities from March 1 to June 30. Crucial winter habitat will be closed from December 16 to March 15.	Exceptions will be granted according to criteria established in Appendix B of the RMP.

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
Sage-grouse				
BLM	Instruction Memorandum No. WY-2012-019	Sage-grouse nesting/early brood-rearing habitat in core areas	Surface disturbing and/or disruptive activities are prohibited from March 15 to June 30 to protect sage-grouse nesting and early brood rearing habitat. Apply this restriction to all nesting and early brood-rearing habitats inside core areas regardless of distance from the lek. Where credible data support different timeframes for this seasonal restriction, dates may be expanded by up to 14 days prior to or subsequent to the above dates.	Exceptions to lease stipulations, conditions of approval, and terms and conditions, etc. will continue to be considered on a case-by-case basis consistent with approved RMPs and other BLM policy and regulations as they relate to exceptions.
BLM	Instruction Memorandum No. WY-2012-019	Sage-grouse nesting/early brood-rearing habitat in connectivity areas	Surface disturbing and/or disruptive activities are prohibited from March 15 to June 30 to protect nesting and early brood-rearing habitats within 4 miles of the lek or lek perimeter of any occupied sage-grouse lek in identified connectivity areas. Where credible data support different timeframes for this seasonal restriction, dates may be expanded by up to 14 days prior to or subsequent to the above dates.	Exceptions to lease stipulations, conditions of approval, and terms and conditions, etc. will continue to be considered on a case-by-case basis consistent with approved RMPs and other BLM policy and regulations as they relate to exceptions.
BLM	Instruction Memorandum No. WY-2012-019	Sage-grouse nesting/early brood-rearing habitat outside core or connectivity areas	Surface disturbing and/or disruptive activities are prohibited from March 15 to June 30 to protect sage-grouse nesting and early brood rearing habitats within 2 miles of the lek or lek perimeter of any occupied lek located outside core or connectivity areas. Where credible data support different timeframes for this seasonal restriction, dates may be expanded by up to 14 days prior to or subsequent to the above dates.	Exceptions to lease stipulations, conditions of approval, and terms and conditions, etc. will continue to be considered on a case-by-case basis consistent with approved RMPs and other BLM policy and regulations as they relate to exceptions.
BLM	Instruction Memorandum No. WY-2012-019	Sage-grouse late brood-rearing and winter concentration areas	Surface disturbing and/or disruptive activities in sage-grouse winter concentration areas are prohibited from December 1 to March 14 to protect core	Exceptions to lease stipulations, conditions of approval, and terms and conditions, etc. will continue to be considered on a case-by-case basis consistent with approved RMPs and other

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
			populations of sage-grouse that use these winter concentration habitats. While the bulk of winter and late brood rearing habitat necessary to support core area populations is available in core population areas, it may be necessary to protect additional areas of winter concentration that are not located in the current core area boundaries. Appropriate seasonal timing restrictions and habitat protection measures must be considered and evaluated where winter concentration areas or important late brood-rearing areas are identified as supporting populations of greater sage-grouse that attend leks in core.	BLM policy and regulations as they relate to exceptions.
State of Wyoming	Executive Order for Greater Sage-grouse in Wyoming, 2011	Outside of the 0.6 mile perimeter of a lek in core areas where breeding, nesting and early brood-rearing habitat is present; unsuitable habitat; winter concentration areas	Activity (Note: production and maintenance activity exempted) will be allowed from July to March 14 outside of the 0.6 mile perimeter of a lek in core areas where breeding, nesting and early brood-rearing habitat is present. In areas used solely as winter concentration areas, exploration and development activity will be allowed March 14 to December 1. Activities in unsuitable habitat may also be approved year-round (including March 15 to June 30) on a case-by-case basis (except in specific areas where credible data shows calendar deviation). Activities may be allowed during seasonal closure periods as determined on a case-by-case basis. While the bulk of winter habitat necessary to support core sage-grouse populations likely	None

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
			occurs inside Core Population Areas, seasonal stipulations (December 1 to March 14) should be considered in locations outside Core Population Areas where they have been identified as winter concentration areas necessary for supporting biologically significant numbers of sage-grouse nesting in Core Population Areas. All efforts should be made to minimize disturbance to mature sagebrush cover in identified winter concentration areas.	
State of Wyoming	Executive Order for Greater Sage-grouse in Wyoming, 2011	Outside 0.6 miles of the perimeter of occupied sage-grouse leks	New noise levels, at the perimeter of a lek, should not exceed 10 decibels above ambient noise (existing activity included) from 6:00 p.m. to 5:00 a.m. During the initiation of breeding (March 1 to May 15). Ambient noise levels should be determined by measurements taken at the perimeter of a lek at sunrise.	Exceptions: Any exceptions to these general or specific stipulations will be considered on a case by case basis and must show that the exception will not cause declines in sage-grouse populations.
State of Wyoming	Executive Order for Greater Sage-grouse in Wyoming, 2011	Within 4 miles of an occupied lek; unsuitable habitat.	Vegetation removal should be limited to the minimum disturbance required by the project. All topsoil stripping and vegetation removal in suitable habitat will occur between July 1 and March 14 in areas that are within 4 miles of an occupied lek. Initial disturbance in unsuitable habitat between March 15 and June 30 may be approved on a case-by-case basis.	Exceptions: Any exceptions to these general or specific stipulations will be considered on a case by case basis and must show that the exception will not cause declines in sage-grouse populations.
Colorado Division of Wildlife	Colorado Greater Sage-grouse Conservation Plan	Breeding habitat; summer-fall habitat; winter habitat	Avoid activities in breeding habitat (March-July), lek habitat (March to mid-May), nesting habitat (April to June), early brood-rearing habitat (mid-May- July), summer-fall habitat (July to September), and winter habitat (October to February)	None
Colorado Division of Wildlife	Colorado Greater Sage-grouse Conservation Plan	Lek habitat	Any activities associated with anthropogenic features, or any other bird-disturbing activities, should be limited between sunset and 2 hours after sunrise.	None

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
Colorado Division of Wildlife	Conservation Plan for Greater Sage-grouse in Utah, 2013	Sage-grouse lek	Employ seasonal disturbance stipulations as follows: - Implement time-of-day stipulations during the season when the lek is occupied (e.g., no activity from 2 hours before sunrise to 2 hours after sunrise). - Avoid activities (i.e., construction, vehicle noise, etc.) that will disturb lek attendance or breeding from February 15 to May 15. The local Division of Wildlife Resources biologist should be consulted for time and distance determinations based on site-specific conditions.	None
Colorado Division of Wildlife	Conservation Plan for Greater Sage-grouse in Utah, 2013	Nesting and brood-rearing area	Avoid activities (i.e., construction, vehicle noise, etc.) that will disturb nesting or brood-rearing from April 1 to August 15. The local Division of Wildlife Resources biologist should be consulted for time and distance determinations based on site-specific conditions.	None
Colorado Division of Wildlife	Conservation Plan for Greater Sage-grouse in Utah, 2013	Winter habitat	Avoid activities (i.e., construction, vehicle noise, etc.) that will disturb wintering sage-grouse from November 15 to March 15. The local Division of Wildlife Resources biologist should be consulted for time and distance determinations based on site-specific conditions.	None
BLM	Rawlins Field Office RMP	Within 0.25 mile of perimeter of occupied sage-grouse leks	Disruptive activities are prohibited between 6 p.m. and 9 a.m. from March 1 to May 20	Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.
BLM	Rawlins Field Office RMP	In suitable greater sage-grouse nesting and early brood rearing habitat within 2 miles of the perimeter of an	Avoid ground-disturbing and disruptive activities, geophysical surveys, and organized recreational activities (events) that require a special use permit from March 1 to July 15.	Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
		occupied greater sage-grouse lek, or in identified greater sage-grouse nesting and early brood rearing habitat		
BLM	Rawlins Field Office RMP	Delineated greater sage-grouse winter concentration areas	Ground-disturbing and disruptive activities are prohibited during the period of November 15 to March 14 for the protection of greater sage-grouse winter concentration areas.	None
BLM	Little Snake Field Office RMP	Within a 4 mile radius of the perimeter of a lek	Avoidance areas for ground-disturbing activities between March 1 and June 30. The actual area to be avoided will be determined on a case-by-case basis, depending on applicable scientific research and site-specific analysis and in coordination with commodity users and other appropriate entities. The use of the following best management practices from the RMP will be encouraged for all ground-disturbing activities, and BLM may require implementation of some of these best management practices. Use of these best management practices becomes even more important once a disturbance affects 10 percent of the nesting habitat within a 4 mile radius of an active lek. As new best management practices are developed, they may be added to this list of best management practices or may replace some of those now listed. ▪ Habitat Reclamation: • Use early and effective reclamation techniques, including interim reclamation, to allow sage-grouse habitat to be	None

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
			reestablished as soon as possible. This may require multiple reclamation efforts. Use reclamation seed mixes, consisting of native bunchgrasses, forbs, and subspecies of big sagebrush, that are appropriate for the disturbed site and its potential.	
BLM	Little Snake Field Office RMP	Near active sage-grouse leks	Limit non-ground-disturbing activities during the breeding season, March 1 to May 1, to portions of the day after 9 a.m. and before 4 p.m.	None
BLM	Little Snake Field Office RMP	Crucial winter habitat	Closed from December 16 to March 15	None
BLM	White River Field Office RMP	Sage-grouse nesting habitat; within 2 miles of identified leks	This area encompasses suitable sage grouse nesting habitat associated with Nest Habitat individual leks. This stipulation will not take effect until direct and indirect impacts on suitable nesting cover exceeds 10 percent of the habitat available within 2 miles of identified leks. Further development, after this threshold has been exceeded, will not be allowed from April 15 through July 7. (Note: Development can occur until 10 percent of the habitat associated with a lek is affected, from then on, additional activity can occur from July 8 through April 14).	Exception: The Area Manager may grant an exception if an environmental analysis and consultation with the Colorado Division of Wildlife (CDOW) indicates that the proposed action could be conditioned so as not to affect nest attendance, egg/chick survival, or nesting success. An exception could also be granted if the Applicant, BLM, and CDOW negotiate compensation that would satisfactorily offset the anticipated losses of nesting habitat or nesting activities. Actions designed to enhance the long-term utility or availability of suitable nest habitat may be excepted. Modification: The Area Manager may modify the size of the timing limitation area if an environmental analysis indicates that the proposed action could be conditioned so as not to affect nest attendance, egg/chick survival, or nesting success. Timeframes may be modified if operations could be conditioned to allow a minimum of 70 percent of nesting attempts to progress through hatch. Waiver: This stipulation may be waived if

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
				CDOW determines that the described lands are incapable of serving the long term requirements of sage grouse nesting habitat and that these ranges no longer warrant consideration as components of sage grouse nesting habitat.
BLM	White River Field Office RMP	Sage Grouse Crucial Winter Habitat	This area encompasses sagebrush habitats that are occupied by wintering concentrations of grouse, or represent the only habitats that remain available for use during periods of heavy snowpack. No development activity will be allowed between December 16 and March 1. The CDOW has indicated that these features exist on public lands in the White River Resource Area but have not yet delineated specific areas that will be subject to this timing restriction.	Exception, modification, and waiver language will be developed in cooperation with the CDOW after the affected areas have been delineated.
BLM	Vernal Field Office RMP	Within 2 miles of active sage-grouse leks	No ground-disturbing activities will be allowed from March 1 through June 15.	None
BLM	Moab Field Office RMP	Within 2.0 miles of a lek	Allow no ground-disturbing activities in occupied nesting and brood rearing habitat from March 15 to July 15	Exception: An exception may be granted by the Field Manager if the operator submits a plan that demonstrates that impacts from the proposed action can be adequately mitigated or it is determined the brooding/nesting habitat is not active. Modification: The Field Manager may modify the boundaries of the stipulation area if (1) portions of the area do not include brooding/nesting habitat, or (2) the brooding/nesting habitat has been completely abandoned or destroyed, or (3) occupied brooding/nesting habitat occurs outside the current defined area; as determined by the BLM. Waiver: A waiver may be granted if there is no

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
				active brooding/nesting habitat in the leasehold and it is determined the habitat has been completely abandoned or destroyed or occurs outside the current defined area, as determined by the BLM.
BLM	Moab Field Office RMP	Within occupied winter habitat	Allow no ground-disturbing activities in occupied winter habitat from November 15 to March 14.	Exception: An exception may be granted by the Field Manager if the operator submits a plan that demonstrates that impacts from the proposed action can be adequately mitigated or it is determined the habitat is not occupied during the winter season. Modification: The Field Manager may modify the boundaries of the stipulation area if: ▪ portions of the area do not include winter habitat, or ▪ the brooding/nesting habitat has been completely abandoned or destroyed, or ▪ occupied winter activity occurs outside the current defined area; as determined by the BLM. Waiver: A waiver may be granted if the winter habitat in the leasehold has been completely abandoned or destroyed or occurs outside the current defined area, as determined by the BLM.
BLM	Price Field Office RMP	Within 2 miles of a known greater sage-grouse lek.	Allow no ground-disturbing or otherwise disruptive activities between March 15 to July 15	Exception: The Authorized Officer may grant an exception if an environmental analysis demonstrates that the action would not impair the function or utility of the habitat for nesting or early brood-rearing activities. Modification: Season may be adjusted depending on climatic and habitat conditions. Disturbance could occur if the activity were proposed to occur in the buffer, but would occur in non-sagebrush habitat, (i.e., the

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
				activity could be allowed if it was not in sage-grouse habitat and did not in some other way disturb nesting or brood-rearing activity). Waiver: This stipulation may be waived if, in cooperation with Utah Division of Wildlife Resources (UDWR), it is determined that the site has been permanently abandoned or unoccupied for a minimum of 5 years.
BLM	Price Field Office RMP	Sage-grouse wintering areas; crucial winter habitat	Closed seasonally between December 1 and March 14	Exception: Upon review and monitoring, the Authorized Officer may grant exceptions because of climatic and/or habitat conditions if certain criteria are met and if activities would not cause undue stress to wintering greater sage-grouse. Modification: Season may be adjusted depending on climatic and habitat conditions. Waiver: This stipulation may be waived if, in cooperation with the state wildlife agency, it is determined that the site has been permanently abandoned or unoccupied for a minimum of 5 years.
BLM	Salt Lake Field Office RMP	Within 0.5 mile of sage grouse strutting grounds (leks) and crucial sage grouse nesting habitat; in winter crucial habitat areas	BLM will protect from disturbing activities within 0.5 mile of sage grouse strutting grounds (leks) and crucial sage grouse nesting habitat between March 15 and June 15 each year, and in winter crucial habitat areas December 1 through March 1.	Specific exceptions may be granted by BLM if the proposed activity will not seriously disturb the wildlife habitat values being protected.
Southwestern Willow Flycatcher				
BLM	Moab Field Office RMP	Within occupied southwestern willow flycatcher habitat.	Unavoidable ground disturbing activities in occupied southwestern willow flycatcher habitat should only be conducted when preceded by current year survey, should only occur between August 16 and April 30 (i.e., the period when southwestern willow flycatcher are not likely to	None

TABLE E-11 SEASONAL RESTRICTIONS IN SENSITIVE HABITATS				
Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
			be breeding), and should be monitored to ensure that adverse impacts on southwestern willow flycatcher are minimized or avoided, and to document the success of project-specific mitigation/protection measures. As monitoring is relatively undefined, project-specific requirements must be identified.	
BLM	Moab Field Office RMP	Within 0.25 mile of suitable southwestern willow flycatcher habitat	Habitat disturbances (i.e., organized recreational activities requiring special use permits, drilling activities, etc.) will be avoided within 0.25 mile of suitable southwestern willow flycatcher habitat from May 1 to August 15.	None
BLM	Richfield Field Office RMP	All ground-disturbing activities should be restricted within a 0.25-mile buffer from suitable riparian habitats and permanent surface disturbances should be avoided within 0.5 mile of suitable southwestern willow flycatcher habitat.	Unavoidable ground disturbing activities in occupied southwestern willow flycatcher habitat should only be conducted when preceded by current year survey, should only occur between August 16 and April 30 (i.e., the period when southwestern willow flycatcher are not likely to be breeding), and should be monitored to ensure that adverse impacts on southwestern willow flycatcher are minimized or avoided, and to document the success of project-specific mitigation/protection measures. As monitoring is relatively undefined, project-specific requirements must be identified.	None
Mountain Plover				
BLM	Rawlins Field Office RMP	Potential mountain plover habitat	Ground-disturbing and disruptive activities (including reclamation activities) are not allowed during the reproductive period of April 10 to July 10 for the protection of breeding and nesting mountain plover.	Unless surveys consistent with the plover guidelines or other methods approved by the U.S. Fish and Wildlife Service find that no plovers are nesting in the area. Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
BLM	Rawlins Field Office RMP	Within 0.5 mile of the identified mountain plover-occupied habitat	Traffic will be minimized and Speed limits will be posted at 25 miles per hour (mph) on resources roads and 35 mph on local roads during the brood-rearing period (June 1– July 10).	Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.
BLM	Rawlins Field Office RMP	Identified mountain plover-occupied habitat	Traffic speed and traffic volume will be limited during nighttime hours from April 10 to July 10	Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.
BLM	Rawlins Field Office RMP	Identified mountain plover-occupied habitat	Work schedules and shift changes will be modified from June 1 to July 10 to avoid the periods of activity from a ½ hour before sunrise to 10:00 a.m. and from 5:00 p.m. to a ½ hour after sunset.	Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.
BLM	Little Snake Field Office RMP	Within 0.25 mile of all plover nest sites	Prohibit surface use from April 1 to July 15	The boundaries of the stipulated area may be modified if the Authorized Officer determines that portions of the area are not critical to the mountain plover.
Western Yellow-billed Cuckoo				
BLM	Rawlins Field Office RMP	Within 0.5 mile of identified habitat	Ground-disturbing and disruptive activities potentially disruptive to Western yellow-billed cuckoos are prohibited from April 15 to August 15 for the protection of nesting Western yellow-billed cuckoos.	Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.
BLM	Little Snake Field Office RMP	Current yellow-billed cuckoo habitat	Construction of roads, pipelines, and power lines through riparian habitat should not occur from June 1 through August 1.	None
Raptors				
BLM	Moab Field Office RMP	Within spatial buffers (0.25 mile for burrowing owl and 0.5 mile for ferruginous hawk) of known nesting sites.	In habitat for raptor species, no surface disturbances or occupancy will be conducted during the breeding and nesting season (March 1 to August 31 for burrowing owl and March 1 to August 1 for ferruginous hawk).	Exception: An exception would be granted if protocol surveys determine that nesting sites, breeding territories, and winter roosting areas are not occupied.

TABLE E-11 SEASONAL RESTRICTIONS IN SENSITIVE HABITATS				
Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
UDWR	Recommended stipulations	Within 0.5 mile of known ferruginous hawk nesting sites.	Restrictions on activities are recommended from February 1 to July 1 (UDWR 2013b).	
Migratory Birds				
BLM	Price Field Office RMP	High-value breeding habitat	Migratory bird nesting areas would be closed seasonally. Birds designated as BLM Special Status Species would have the highest priority.	Exception: Upon review and monitoring, the Authorized Officer may grant exceptions because of climatic and/or habitat conditions if activities would not cause undue stress to migratory bird populations. Modification: Season may be adjusted depending on climatic and range conditions. Distance may be adjusted if natural features provide adequate visual screening. Waiver: None
Big Game - General				
BLM	Rawlins Field Office RMP	Big game (i.e., elk, moose, deer, antelope. And bighorn sheep) crucial winter range	Ground-disturbing and disruptive activities in big game crucial winter range will not be allowed during the period of November 15 to April 30.	Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.
BLM	Rawlins Field Office RMP	Big game (i.e., elk, bighorn) parturition areas	Ground-disturbing and disruptive activities in big game crucial winter range will not be allowed during the period of May 1 to June 30.	Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.
BLM	Little Snake Field Office RMP	Big game (i.e., mule deer, elk, pronghorn antelope, and bighorn sheep)	Crucial winter habitat will be closed to surface disturbing activities from December 1 to April 30. Big game birthing areas will be closed to surface disturbing activities for the following species and during the following periods: elk calving (April 16 to June 30), pronghorn antelope fawning (May 1 to July 15), and bighorn sheep lambing (May 1 to July 15).	This stipulation will be applied after the big game hunting season. In the case that hunting season extends later, exceptions will be applied through normal procedures.
BLM	White River Field Office RMP	Big game severe winter range	No development activity is allowed from December 1 through April 30.	Exception: The Area Manager may grant an exception if an environmental analysis indicates that the proposed action could be

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
				conditioned so as not to interfere with habitat function or compromise animal condition in the project vicinity. An exception may also be granted if the Applicant, BLM, and CDOW negotiate compensation that would satisfactorily offset anticipated impacts on big game winter activities or habitat condition. Under mild winter conditions, when prevailing habitat or weather conditions allow early dispersal of animals from all or portions of a project area, an exception may be granted to suspend the last 60 days of this seasonal limitation. Severity of winter will be determined on the basis of snow depth, snow crusting, daily mean temperatures, and whether animals were concentrated on the winter range during the winter months. Exceptions may also be granted for actions specifically intended to enhance the long term utility or availability of suitable habitat. Modification: The Area Manager may modify the size and-timeframes of this stipulation if CDOW monitoring information indicates that current animal use patterns are inconsistent with dates established for animal occupation. Modifications may also be authorized if the proposed action could be conditioned so as not to interfere with habitat function or compromise animal condition. In addition, if the Applicant, BLM, and CDOW agree to habitat compensation that satisfactorily offsets detrimental impacts on activity or habitat condition. Waiver: This stipulation may be waived if the CDOW determines that all or specific portions of the area no longer satisfy this functional

TABLE E-11 SEASONAL RESTRICTIONS IN SENSITIVE HABITATS				
Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
				capacity.
Elk				
BLM	Grand Junction Field Office RMP	Elk winter range	- No new construction activities will occur; - all activities will be conducted during daylight hours only; and - vehicular access on a daily basis will be limited to a single trip between December 1 and May 1.	None
BLM	Grand Junction Field Office RMP	Elk calving grounds	- No new construction activities will occur; - all activities will be conducted during daylight hours only; and - vehicular access on a daily basis will be limited to a single trip between May 15 to June 15.	None
BLM	White River Field Office RMP	Elk production areas	This area encompasses an elk production area. No development is allowed from May 15 through June 30.	Exception: The Area Manager may grant an exception if an environmental analysis indicates that the proposed action can be conditioned so as not to interfere with habitat function or compromise animal condition in the project vicinity. An exception may also be granted if the Applicant, BLM, and CDOW negotiate compensation that would satisfactorily offset anticipated impacts on elk production or habitat condition. An exception may also be granted for actions intended to enhance the long term utility or availability of suitable habitat Modification: The Area Manager may modify the size and timeframes of this stipulation if CDOW monitoring information indicates that current animal use patterns are inconsistent with dates established for animal occupation. Modifications could be authorized if the proposed action could be conditioned so as not to interfere with critical habitat function or

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
				compromise animal condition. A modification may also be approved if the Applicant, BLM, and CDOW agree to compensation that satisfactorily offset detrimental impacts on elk production or habitat condition. Waiver: This stipulation may be waived if CDOW determines that the area is no longer utilized by elk for production purposes.
BLM	White River Field Office RMP	Elk/Deer summer range	This area is located in deer and elk summer ranges, which due to limited extent, are considered critical habitat in appropriate CDOW game management units. This stipulation will not take effect until direct and indirect impacts on suitable summer range habitats exceed 10 percent of that available in the individual Game Management Units. When this threshold has been reached, no further development activity will be allowed from May 15 through August 15 (Note: Development is allowed until 10 percent of individual game management unit summer habitat has been affected, then additional development is allowed from August 16 through May 14).	Exception: The Area Manager may grant an exception if an environmental analysis indicates that the proposed action could be conditioned to have no additional influence on the utility or suitability of summer range habitats. An exception may also be granted if the Applicant, BLM, and CDOW negotiate compensation that would satisfactorily offset anticipated impacts on summer range function or habitat. Exceptions may also be granted for actions specifically intended to enhance the long term utility or availability of suitable habitat. Modification: The Area Manager may modify the size and timeframes of this stipulation if CDOW monitoring information indicates that current animal-use patterns are inconsistent with dates established for animal occupation. Modifications may also be authorized if the proposed action could be conditioned to have no additional influence on the utility or suitability of summer range habitats. Waiver: This stipulation may be waived if the CDOW determines that all or specific portions of the area no longer satisfy this functional capacity or that these summer ranges no longer merit critical habitat status. Waivers will also be applied to delineated summer range

TABLE E-11 SEASONAL RESTRICTIONS IN SENSITIVE HABITATS				
Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
				occurring below 2,250 meters (7,350 feet) in elevation.
BLM	Vernal Field Office RMP	Elk/deer crucial winter range	Activities that will result in adverse impacts on deer and elk within crucial winter range will not be allowed from December 1 through April 30.	This restriction will not apply if deer and/or elk are not present, or if it is determined through analysis and coordination with UDWR that impacts will be mitigated. Factors to be considered will include snow depth, temperature, snow crusting, location of disturbance, forage quantity and quality, animal condition, and expected duration of disturbance.
BLM	Moab Field Office RMP	Elk/deer winter range	Do not allow ground-disturbing activities from November 15 to April 15.	Exception: This stipulation does not apply to the maintenance and operation of existing and ongoing facilities. An exception may be granted by the Field Manager if the operator submits a plan that demonstrates that impacts from the proposed action can be adequately mitigated or it is determined the habitat is not being utilized during the winter period for any given year. Modification: The Field Manager may modify the boundaries of the stipulation area (1) if a portion of the area is not being used as winter range by deer/elk or (2) if habitat is being utilized outside of stipulation boundaries as winter range and needs to be protected or (3) if the migration patterns have changed causing a difference in the season of use. Waiver: May be granted if the winter range habitat is unsuitable or unoccupied during winter months by deer/elk and there is no reasonable likelihood of future winter range use.

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
BLM	Moab Field Office RMP	Deer and elk fawning and calving habitat (Bookcliffs and La Sal Wildlife Management Units)	Allow no ground-disturbing activities from May 15 to June 30.	Exception: This stipulation does not apply to the maintenance and operation of existing and ongoing facilities. An exception may be granted by the Field Manager if the operator submits a plan that demonstrates that impacts from the proposed action can be adequately mitigated or it is determined the habitat is not being utilized during the critical period for any given year. Modification: The Field Manager may modify the boundaries of the stipulation area (1) if a portion of the area is not being used as fawning and calving habitat or (2) if the habitat is being utilized outside of stipulation boundaries and needs to be protected or (3) if the migration patterns have changed causing a difference in the season of use. Waiver: May be granted if the fawning and calving habitat is unsuitable or unoccupied during winter months by deer/elk and there is no reasonable likelihood of future winter range use.
BLM	Price Field Office RMP	Elk and mule deer crucial winter habitat	Closed December 1 to April 15	Exception: Upon review and monitoring, the Authorized Officer may grant exceptions because of climatic and/or range conditions if certain criteria are met and if activities would not cause undue stress to deer and elk populations or habitats. Modification: Season may be adjusted depending on climatic and range conditions. Waiver: A waiver may be granted if the winter range habitat is unsuitable for or unoccupied during winter months by deer/elk and there is no reasonable likelihood of future winter range use.

TABLE E-11 SEASONAL RESTRICTIONS IN SENSITIVE HABITATS				
Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
BLM	Price Field Office RMP	Elk calving and mule deer fawning areas located in the crucial summer habitat	Closed May 15 to July 5	Exception: Upon review and monitoring, the Authorized Officer may grant exceptions because of climatic and/or range conditions if certain criteria are met and if activities would not cause undue stress to deer and elk populations or habitats. Modification: Season may be adjusted depending on climatic and range conditions. Waiver: A waiver may be granted if the fawning and calving habitat is unsuitable or unoccupied by deer/elk and there is no reasonable likelihood of future use.
BLM	Salt Lake Field Office RMP	In crucial elk winter range; calving areas	BLM will protect important wildlife habitat values from disturbing activities by restricting seismic work, well development, new road construction, rights-of-way, and other disturbing activities (excluding maintenance activities) from December 1 to April 30, and calving areas May 1 to June 30.	None
UDWR	Recommended stipulations	Elk rut in crucial winter and summer range and calving areas	Restrictions on activities are recommended from September 1 to October 15.	
Mule Deer				
BLM	Grand Junction Field Office RMP	Deer winter range	- No new construction activities will occur; - all activities will be conducted during daylight hours only; and - vehicular access on a daily basis will be limited to a single trip between December 1 and May 1.	None
BLM	Vernal Field Office RMP	Mule deer migration corridors in McCook and Monument Ridge	No ground-disturbing activities will be allowed from April 15 through May 31	None
BLM	Salt Lake Field Office RMP	In mule deer winter range	BLM will protect important wildlife habitat values from disturbing activities by restricting	Specific exceptions may be granted by BLM if the proposed activity will not seriously disturb

TABLE E-11
SEASONAL RESTRICTIONS IN SENSITIVE HABITATS

Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
			seismic work, well development, new road construction, rights-of-way, and other disturbing activities (excluding maintenance activities) from December 1 to April 15.	the wildlife habitat values being protected.
BLM	Salt Lake Field Office RMP	In crucial mule deer summer/fawning habitats	BLM will protect important wildlife habitat values from disturbing activities by restricting seismic work, well development, new road construction, rights-of-way, and other disturbing activities (excluding maintenance activities) from April 15 to July 1.	Specific exceptions may be granted by BLM if the proposed activity will not seriously disturb the wildlife habitat values being protected.
UDWR	Recommended stipulations	Mule deer rut in crucial winter range	Restrictions on activities are recommended from November 1 to November 30	None
UDWR	Recommended stipulations	Mule deer winter range	Restrictions on activities are recommended from November 1 to April 1	None
UDWR	Recommended stipulations	Mule deer parturition in crucial summer range	Restrictions on activities are recommended from May 15 to July 15	None
Pronghorn				
BLM	White River Field Office RMP	Pronghorn production areas	No development activity is allowed in this area between May 1 and June 30. The CDOW has indicated that these features exist on public lands in the White River Resource Area but have not yet delineated specific areas that will be subject to this timing restriction.	Specific exception, modification, and waiver language will be developed in cooperation with the CDOW after the affected areas have been delineated.
BLM	Vernal Field Office RMP	Pronghorn fawning ground in Antelope Flat	Do not allow activities that will result in adverse impacts on antelope from May 1 through June 30.	This restriction does not apply if pronghorn are not present or if impacts will be mitigated through other management actions. This restriction also does not apply to maintenance and operations of existing facilities.
BLM	Moab Field Office RMP	Pronghorn fawning grounds in Cisco Desert and Hatch Point (LaSal Wildlife Management Units)	Allow no ground-disturbing activities from May 1 to June 15.	Exception: May be granted to these dates by the Field Manager if the operator submits a plan that demonstrates that impacts from the proposed action can be adequately mitigated or if it is determined the habitat is not being utilized for fawning in any given year.

TABLE E-11 SEASONAL RESTRICTIONS IN SENSITIVE HABITATS				
Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
				Modification: The Field Manager may modify the boundaries of the stipulation area if a portion of the area is not being used as fawning grounds or if habitat is being utilized outside of stipulation boundaries as crucial fawning grounds and needs to be protected. Waiver: May be granted if the fawning grounds are determined to be unsuitable or unoccupied and there is no reasonable likelihood of future use of the fawning grounds.
BLM	Salt Lake Field Office RMP	In antelope fawning areas	BLM will protect important wildlife habitat values from disturbing activities by restricting seismic work, well development, new road construction, rights-of-way, and other disturbing activities excluding maintenance activities from April 15 to July 1.	Specific exceptions may be granted by BLM if the proposed activity will not seriously disturb the wildlife habitat values being protected.
Moose				
BLM	Price Field Office RMP	Crucial yearlong moose habitat	Closed seasonally December 1 to April 15	Exception: Upon review and monitoring, the Authorized Officer may grant exceptions because of climatic and/or range conditions if certain criteria are met and if activities would not cause undue stress to moose populations or habitats. Modification: Season may be adjusted depending on climatic and range conditions. Waiver: A waiver may be granted if the winter range habitat is unsuitable or unoccupied during winter months by moose and there is no reasonable likelihood of future winter range use.
Bighorn Sheep				
BLM	Grand Junction Field Office RMP	Bighorn winter range	▪ No new construction activities will occur; ▪ all activities will be conducted during daylight hours only; and	None

TABLE E-11 SEASONAL RESTRICTIONS IN SENSITIVE HABITATS				
Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
			vehicular access on a daily basis will be limited to a single trip between December 1 and May 1.	
BLM	Price Field Office RMP	Desert bighorn sheep and Rocky Mountain bighorn sheep crucial yearlong habitat	Closed seasonally April 15 to June 15	Exception: Upon review and monitoring, the Authorized Officer may grant exceptions because of climatic and/or range conditions if certain criteria are met and if activities would not cause undue stress to desert bighorn sheep and Rocky Mountain bighorn sheep populations or habitats. Modification: Season may be adjusted depending on climatic and range conditions. Waiver: A waiver may be granted if the habitat is determined to be unsuitable for lambing and there is no reasonable likelihood of future use as bighorn lambing grounds.
Wild Horses				
BLM	Little Snake Field Office RMP	Within a 1-mile radius from wild horse water sources	No drilling or development operations will be permitted from March 1 to December 1.	None
BLM	Grand Junction Field Office RMP	Wild horse winter range	- No new construction activities will occur; - all activities will be conducted during daylight hours only; and - vehicular access on a daily basis will be limited to a single trip between December 1 and May 1.	None
BLM	Grand Junction Field Office RMP	Wild horse foaling	- No new construction activities will occur; - all activities will be conducted during daylight hours only; and - vehicular access on a daily basis will be limited to a single trip between March 1 to July 1.	None

TABLE E-11 SEASONAL RESTRICTIONS IN SENSITIVE HABITATS				
Agency	Applicable Plan	Area to Which Restriction Applies	Restriction	Exception
BLM	White River Field Office RMP	Herd management areas	To protect wild horses in this area, intensive development activities may be delayed for a specified 60 day period in the spring foaling period between March 1 and June 15.	None

TABLE E-12 SPATIAL AND SEASONAL BUFFERS FOR BREEDING RAPTORS IN WYOMING				
Common Name	Wyoming Ecological Services Field Office		Bureau of Land Management Rawlins Field Office	
	Spatial Buffer (miles)	Seasonal Buffer	Spatial Buffer (miles)	Seasonal Buffer
Raptors of Conservation Concern				
Golden eagle	0.50	January 15 to July 31	1.0	February 1 to July 15
Ferruginous hawk	1.0	March 15 to July 31	1.0	March 1 to July 31
Swainson's hawk	0.25	April 1 to August 31	0.75	April 1 to July 31
Bald eagle communal roost areas ¹	–	–	2.0	Surface disturbing or other disruptive activities potentially disruptive to a bald eagle communal roost will be prohibited within 2 miles of the communal roost during the period of February 1 to August 15.
Bald eagle communal winter roost areas	–	–	1.0	Surface disturbing or other disruptive activities potentially disruptive to identified bald eagle communal winter roost sites will be prohibited within 1 mile of the winter roost site from November 1 to April 1. No ground disturbing activities will be permitted within 0.5-mile of active bald eagle communal winter roost sites year-round ² .
Bald eagle	Refer to National Bald Eagle Management Guidelines	See National Bald Eagle Management Guidelines	Refer to National Bald Eagle Management Guidelines	Refer to National Bald Eagle Management Guidelines
Prairie falcon	0.50	March 1 to August 15	0.75	April 1 to July 31
Peregrine falcon	0.50	March 1 to August 15	0.75	March 1 to July 31
Short-eared owl	0.25	March 15 to August 1	0.75	March 1 to July 31
Burrowing owl	0.25	April 1 to September 15	0.75	April 1 to September 15
Northern goshawk	0.50	April 1 to August 15	0.75	April 1 to August 31
Additional Wyoming Raptors				
Osprey	0.25	April 1 to August 31	0.75	April 1 to July 31
Cooper's hawk	0.25	March 15 to August 31	0.75	April 1 to July 31
Sharp-shinned hawk	0.25	March 15 to August 31	0.75	April 1 to July 31
Red-tailed hawk	0.25	February 1 to August 15	0.75	February 1 to July 15

TABLE E-12 SPATIAL AND SEASONAL BUFFERS FOR BREEDING RAPTORS IN WYOMING				
Common Name	Wyoming Ecological Services Field Office		Bureau of Land Management Rawlins Field Office	
	Spatial Buffer (miles)	Seasonal Buffer	Spatial Buffer (miles)	Seasonal Buffer
Rough-legged hawk (winter resident only)	–	–	–	–
Northern harrier	0.25	April 1 to August 15	0.75	April 1 to July 31
Merlin	0.50	April 1 to August 15	0.75	April 1 to July 31
American kestrel	0.13	April 1 to August 15	0.75	April 1 to July 31
Common barn owl	0.13	February 1 to September 15	0.75	February 1 to July 15
Northern saw-whet owl	0.25	March 1 to August 31	–	–
Boreal owl	0.25	February 1 to July 31	–	–
Long-eared owl	0.25	February 1 to August 15	0.75	March 1 to July 31
Great horned owl	0.13	December 1 to September 30	0.75	February 1 to July 15
Northern pygmy-owl	0.25	April 1 to August 1	–	–
Eastern screech -owl	0.13	March 1 to August 15	0.75	March 1 to July 31
Western screech-owl	0.13	March 1 to August 15	0.75	March 1 to July 31
Great gray owl	0.25	March 15 to August 31	–	–
SOURCE: Bureau of Land Management 2008b; U.S. Fish and Wildlife Service 2012f				
NOTES:				
¹ A communal roost is defined as an area usually less than 10 acres in size that contains or has contained more than 6 bald eagles on any given night.				
² The year-round buffer zone on ground disturbing activities of 0.5 mile of active bald eagle communal winter roost sites may be adjusted based on site-specific information through coordination with (including written concurrence) the U.S. Fish and Wildlife Service, Wyoming Field Office.				

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TABLE E-13 RECOMMENDED SPATIAL AND SEASONAL BUFFERS FOR BREEDING RAPTORS IN COLORADO				
Common Name	Colorado Department of Wildlife		Bureau of Land Management Field Office ²	
	Spatial Buffer (miles)	Seasonal Buffer ¹	Spatial Buffer (miles)	Seasonal Buffer ¹
Raptor nesting sites; listed, proposed, and candidate threatened and endangered and Bureau of Land Management (BLM) sensitive except bald eagle and ferruginous hawks	–	–	0.50	This area encompasses the nests of threatened, endangered, or candidate raptors. No development activities are allowed within 0.5 mile of identified nest sites from February 1 through August 15, or until fledgling and dispersal of young (White River Field Office ³).

**TABLE E-13
RECOMMENDED SPATIAL AND SEASONAL BUFFERS
FOR BREEDING RAPTORS IN COLORADO**

Common Name	Colorado Department of Wildlife		Bureau of Land Management Field Office ²	
	Spatial Buffer (miles)	Seasonal Buffer ¹	Spatial Buffer (miles)	Seasonal Buffer ¹
Raptor nesting sites; other than threatened and endangered and candidate threatened and endangered species	–	–	0.50	No development activities are allowed within 0.5 mile of identified nests from February 1 through August 15, or until fledgling and dispersal of young (White River Field Office ³).
Bald eagle nests	0.50	October 15 to July 31	0.25	February 1 to August 15 (No development is allowed within 0.5 mile of identified nests from December 15 to July 15, or until fledgling and dispersal of young in White River Field Office ³).
Bald eagle concentration areas	–	–	–	Protect bald eagle concentration areas from ground-disturbing activities from December 1 to April 1 (Grand Junction Field Office).
Active bald eagle winter night roost without a direct line of sight	0.25	November 15 to March 15	0.25	February 1 to August 15 (within 0.5 mile of identified roost sites or concentration areas from November 1 to April 15 White River Field Office ³).
Bald eagle hunting perch	Contact Colorado Department of Wildlife (CDOW)	Contact CDOW	0.25	February 1 to August 15
Ferruginous hawk	0.50	February 1 to July 15	1.0	No development is allowed within 1 mile of identified nests from February 1 through August 15, or until fledgling and dispersal of young (White River Field Office ³).
Golden eagle	0.50	December 15 to March 15	0.25	February 1 to August 15
Prairie falcon	0.5	March 15 to July 15	0.25	February 1 to August 15
Peregrine falcon	0.5	March 15 to July 31	0.25	February 1 to August 15 (March 15- July 1 in Grand Junction Field Office)
Burrowing owl	150 feet	March 15 to October 31	0.25	February 1 to August 15
Northern goshawk	0.50	March 1 to September 15	0.25	February 1 to August 15
Osprey	0.25	April 1 to August 31	0.25	February 1 to August 15

**TABLE E-13
RECOMMENDED SPATIAL AND SEASONAL BUFFERS
FOR BREEDING RAPTORS IN COLORADO**

Common Name	Colorado Department of Wildlife		Bureau of Land Management Field Office ²	
	Spatial Buffer (miles)	Seasonal Buffer ¹	Spatial Buffer (miles)	Seasonal Buffer ¹
Red-tailed hawk	0.33	February 15 to July 15	0.25	February 1 to August 15
Swainson's hawk	0.25	April 1 to July 15	0.25	February 1 to August 15
All other raptors	Not applicable	Not applicable	0.25	February 1 to August 15

SOURCE: Bureau of Land Management 2011d; Colorado Parks and Wildlife 2008

NOTES:

¹Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.

²Little Snake Field Office unless otherwise noted.

³**Exception:** An exception may be granted to these dates by the Area Manager, if authorization is obtained from the U.S. Fish and Wildlife Service (through applicable provisions of the Endangered Species Act, Eagle Protection Act, or Migratory Bird Treaty Act) to harass, harm, wound, or kill in the context of active nesting attempts. An exception can also be granted if an environmental analysis of the proposed action indicates that nature or conduct of the activity could be conditioned so as not to impair the utility of nest for current or subsequent nesting activity or occupancy. The Area Manager may, also grant an exception if the nest is unattended or remains unoccupied by May 15 of the Project year. **Modification:** The Area Manager may modify the size of the stipulation area if an environmental analysis indicates that a portion of the area is nonessential to nest utility or function, or that the proposed action could be conditioned so as not to impair the utility of the nest site for current or subsequent nest activities or occupation. The stipulation may also be modified if the Applicant, BLM, and where necessary, other affected interests, negotiate compensation that satisfactorily offsets anticipated impacts on candidate and BLM sensitive raptor breeding activities and/or habitats. Modifications could also occur if sufficient information is provided that supports the contention that the action would not contribute to the suppression of breeding population densities or the population's production or recruitment regime from a geographic reference area perspective. If a species status is downgraded, or if a species is delisted, the size of the timing limitation area may be reduced. **Waiver:** A waiver may be granted if the species becomes extinct or there is no reasonable likelihood of site occupation over a minimum 10-year period.

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**TABLE E-14
NESTING PERIODS AND RECOMMENDED BUFFERS FOR RAPTORS IN UTAH**

Common Name	All of Utah		Bureau of Land Management Field Office	
	Spatial Buffer (miles)	Seasonal Buffer	Spatial Buffer (miles)	Seasonal Buffer
Known raptor nest sites (within 0.5 mile of nests occupied in the past 3 years) and raptor crucial cliff-nesting complex habitats	—	—	0.50	Closed seasonally between February 1 to July 15 (Price Field Office ¹)

TABLE E-14 NESTING PERIODS AND RECOMMENDED BUFFERS FOR RAPTORS IN UTAH				
Common Name	All of Utah		Bureau of Land Management Field Office	
	Spatial Buffer (miles)	Seasonal Buffer	Spatial Buffer (miles)	Seasonal Buffer
Active and inactive nests; designated as crucial nesting habitat.	–	–	0.25	These areas are classified as Category 2 for fluid mineral leasing, and off-highway vehicle use is limited to existing roads and trails to prevent significant disturbance to nesting raptors from March 1 through June 30 (Fillmore Field Office)
Active raptor nest sites	–	–	0.50	BLM will protect important wildlife habitat values from disturbing activities by restricting seismic work, well development, new road construction, rights-of-way, and other disturbing activities excluding maintenance activities from March 1 to July 15 (Salt Lake Field Office)
Bald eagle	1.0	No surface disturbing activities within 1 mile of identified nest sites from January 1 to August 31	0.50	No surface disturbing activities or development is allowed within 0.5 mile of identified winter roost sites from November 1 through March 31 (Moab Field Office ²)
Golden eagle	0.50	January 1 to August 31	–	–
Northern goshawk	0.50	March 1 to August 15 (March 1 to September 30 in post-fledgling areas USFS ³)	–	–
Northern harrier	0.50	April 1 to August 15	–	–
Cooper's hawk	0.50	March 15 to August 31	–	–
Ferruginous hawk	0.50	March 1 to August 1	–	–
Red-tailed hawk	0.50	March 15 to August 15	–	–
Sharp-shinned hawk	0.50	March 15 to August 31	–	–
Swainson's hawk	0.50	March 1 to August 31	–	–
Turkey vulture	0.50	May 1 to August 15	–	–
Peregrine falcon	1.0	February 1 to August 31	–	–
Prairie falcon	0.25	April 1 to August 31	–	–
Merlin	0.50	April 1 to August 31	–	–
American kestrel	Refer to migratory bird guidelines in Table E-11	April 1 to August 15	–	–
Osprey	0.50	April 1 to August 31	–	–
Boreal owl	0.25	February 1 to July 31	–	–
Burrowing owl	0.25	March 1 to August 31	–	–

TABLE E-14
NESTING PERIODS AND RECOMMENDED BUFFERS FOR RAPTORS IN UTAH

Common Name	All of Utah		Bureau of Land Management Field Office	
	Spatial Buffer (miles)	Seasonal Buffer	Spatial Buffer (miles)	Seasonal Buffer
Flammulated owl	0.25	April 1 to September 30	–	–
Great horned owl	0.25	December 1 to September 31	–	–
Long-eared owl	0.25	February 1 to August 15	–	–
Northern saw-whet owl	0.25	March 1 to August 31	–	–
Short-eared owl	0.25	March 1 to August 1	–	–
Mexican spotted owl	0.50	March 1 to August 31	0.50	For all temporary actions that may impact owls or suitable habitat. If the action occurs entirely outside of the owl breeding season from March 1 through August 31, and leaves no permanent structure or permanent habitat disturbance, the action can proceed without an occupancy survey. If action will occur during a breeding season, survey for owls prior to commencing activity. If owls are found, activity should be delayed until outside of the breeding season (Moab Field Office ⁴)
Northern pygmy owl	0.25	April 1 to August 15	–	–
Eastern and Western screech owl	0.25	March 1 to August 15	–	–
Common barn-owl	Refer to migratory bird guidelines in Table E-11	February 1 to September 15	–	–

SOURCE: Romin and Muck 2002

NOTES:

¹**Exception:** The Authorized Officer may grant an exception if the raptor nest in question is deemed to be inactive by May 31 and if the proposed activity would not result in a permanent structure or facility that would cause the subject nest to become unsuitable for nesting in future years. **Modification:** Season may be adjusted depending on climatic and range conditions. Distance may be adjusted if natural features provide adequate visual screening. **Waiver:** This stipulation may be waived if, in cooperation with the Utah Division of Wildlife Resources, it is determined that the site has been permanently abandoned or unoccupied for a minimum of 3 years.

²Temporary activities or habitat alterations that may disturb nesting bald eagles will be restricted from January 1 to August 31. Additionally, where daily activities must occur in these spatial buffers, and are approved through subsequent consultation, activities should be properly scheduled to occur after 9 a.m. and terminate at least 1 hour before official sunset to ensure that bald eagles using these roosts are allowed the opportunity to vacate their roost in the morning and return undisturbed in the evening.

³USFS LRMP Plan Amendment – Utah Northern Goshawk Project (2000)

⁴Temporary activities are defined as those that are completed prior to the start of the following raptor breeding season, leaving no permanent structures and resulting in no permanent habitat loss.

E.9 Surface Use Restrictions for Biological Resources

Many BLM RMPs, USFS LRMPs, state wildlife management plans, and agency guidelines relevant to the Project area identify restrictions on surface use (e.g., no surface occupancy, conditional surface use, or no surface disturbance) in addition to seasonal restrictions to protect plants, wildlife, and their habitats. Tables E-15 and E-16 summarize restrictions on surface use of lands to protect biological resources and exception criteria, if identified, from agency policies and plans relevant to the Project area.

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
Wetlands and Riparian Areas				
Bureau of Land Management (BLM)	Utah State Office	Within 100 meters of riparian areas	Utah Riparian Policy states that “No new ground-disturbing activities will be allowed”	Exception: An exception could be authorized if: ■ there are no practical alternatives or, ■ all long-term impacts can be fully mitigated, or ■ the activity will benefit and enhance the riparian area.
BLM	Little Snake Field Office Resource Management Plan (RMP)	Up to 0.25 mile from perennial water sources (i.e., streams, rivers, springs, and seeps with perennial flow)	No surface occupancy, if necessary, depending on type and use of the water source, soil type, and slope steepness. Soil/slope characteristics that would initiate this no surface occupancy stipulation include those soils defined as “fragile soils.” The following soil/slope characteristics are indicative of a potentially fragile soil: ■ Soils rated as highly or severely erodible by wind or water, as described in Natural Resources Conservation Service (NRCS) soil survey reports. ■ Soils on slopes greater than 35 percent, particularly if they have one of the following characteristics: • a surface texture that is sand, loamy sand, very fine sandy loam, fine sandy loam, silty clay, or clay; • a depth to bedrock that is less than 20 inches (51 centimeters); • an erosion hazard rating of high or very high; and • a K-factor (soil erodibility potential) factor greater than 0.32.	None
BLM	Grand Junction Field Office RMP	Riparian areas	No surface disturbance in riparian areas year round	None

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
BLM	Vernal Field Office RMP	Within 100 year floodplains or within 100 meters of riparian areas. Also, no ground-disturbing activities in public water reserves or within 100 meters of springs.	No ground-disturbing activities	Exception: An exception could be authorized if: - there are no practical alternatives; - impacts could be fully mitigated; or - the action is designed to benefit and enhance the resource values. Modification: None Waiver: None
BLM	Grand Junction Field Office RMP	Riparian areas and Skippers Island	Prohibit surface disturbance in these areas year round.	None
BLM	Moab Field Office RMP	Within 100 meters of riparian areas; within 100-year floodplains, within 100 meters of a natural spring, or in public water reserves.	Ground-disturbing activities are precluded within 100 meters of riparian areas. Allow no surface occupancy and preclude ground-disturbing activities within 100-year floodplains, within 100 meters of a natural spring, or in public water reserves.	None
BLM	Price Field Office RMP	Natural spring	No surface disturbance or occupancy would be maintained around natural springs to protect the water quality of the spring. The distance would be based on geophysical, riparian, and other factors necessary to protect the water quality of the springs. If these factors cannot be determined, a 660-foot buffer zone would be maintained.	Exception: An exception could be authorized if - there are no practical alternatives; - impacts could be fully mitigated; or - the action is designed to enhance the riparian resources. Modification: None Waiver: None
BLM	Price and Richfield Field Office RMPs	Within 100-year floodplain or 100 meters (330 feet) on either side from the centerline of the selected alternative, whichever is greater, along all perennial and intermittent streams,	No new surface disturbance (excluding fence lines)	Exception: An exception could be authorized if - there are no practical alternatives; - impacts could be fully mitigated; or - the action is designed to enhance the riparian resources. Modification: None Waiver: None

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
		streams with perennial reaches, and riparian areas		
Soils				
BLM	White River Field Office RMP	Landslide areas (i.e., identified soils are considered unstable and subject to slumping and mass movement)	Surface occupancy will not be allowed in such areas delineated from U.S. Department of Agriculture Soil Conservation Service Order III Soil Survey.	Exceptions, modifications, or waivers to this no surface occupancy stipulation may be granted by the Area Manager.
BLM	Grand Junction Field Office RMP	Soil slump hazard areas Baxter-Douglas Pass Plateau Canyon	No surface occupancy stipulation	None
BLM	Grand Junction Field Office RMP	Slopes greater than 40 percent; unstable and slumping soils in the areas of Baxter Pass, Douglas Pass, and Plateau Creek; face of the Bookcliffs	No surface occupancy stipulation; allow other ground-disturbing activities only after analyzing site-specific conditions and potential for safety hazards and reclamation	None
BLM	Vernal Field Office RMP	For slopes greater than 40 percent	No surface disturbance will be allowed unless it is determined that it will cause undue or unnecessary degradation to pursue other placement alternatives.	None
BLM	Price Field Office RMP	For slopes greater than 40 percent	No surface occupancy	Exception: If after an environment analysis the Authorized Officer determines that it would cause undue or unnecessary degradation to pursue other placement alternatives, surface occupancy in the area may be authorized. In addition, a plan from the operator and BLM's approval of the plan would be required before construction and maintenance could begin. The plan would have to include: ▪ An erosion control strategy ▪ Geographic information systems modeling ▪ Proper survey and design by a certified engineer. Modification: None Waiver: None

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
Special Status Plants				
BLM Sensitive Plants and Remnant Vegetation Associations				
BLM	White River Field Office RMP	In known populations of these plants	No surface occupancy will be allowed.	Exceptions, modifications, or waivers to this no surface occupancy stipulation may be granted by the Area Manager.
Known and Potential Habitat for Listed and Candidate Threatened/Endangered Plant Species or Potential Habitat				
BLM	White River Field Office RMP	On mapped populations of these plants	No surface occupancy will be allowed.	Exceptions, modifications, or waivers to this no surface occupancy stipulation may be granted by the Area Manager.
Special Status Plant Species – General				
Clay Phacelia				
U.S. Forest Service/ U.S. Fish and Wildlife Service (FWS)	Clay phacelia conservation measures	Within 650 feet of known occupied habitat	No new development in known occupied sites or within 650 feet of known occupied sites. Existing sites need to be surveyed to determine site boundaries prior to development site selection if development is to occur close to the 650-foot buffer area.	None
Jones Cycladenia				
BLM	Moab Field Office RMP	Within 300 feet of plants and suitable habitat	Preclude ground-disturbing activities within 300 feet of plants and suitable habitat	None
Spineless Hedgehog Cactus				
BLM	Grand Junction Field Office RMP	Actual sites	Prohibit surface disturbance in these areas year round.	The decision to protect habitats by placing stipulations on disturbance type activities will be implemented by comparing activities proposed with areas identified for protective management. Applicable stipulations will be placed on projects that lie in the protected areas.
Uinta Basin Hookless Cactus				
BLM	Grand Junction Field Office RMP	Actual sites	Prohibit surface disturbance in these areas year round.	The decision to protect habitats by placing stipulations on disturbance type activities will be implemented by comparing activities proposed with areas identified for protective management.

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
				Applicable stipulations will be placed on projects that lie in the protected areas.
Special Status Wildlife				
Black-footed Ferret				
BLM	Grand Junction Field Office RMP	Actual sites	Prohibit surface disturbance in these areas year round.	The decision to protect habitats by placing stipulations on disturbance type activities will be implemented by comparing activities proposed with areas identified for protective management. Applicable stipulations will be placed on projects that lie in the protected areas.
White-tailed Prairie Dog				
BLM	Moab Field Office RMP	Within 660 feet of white-tailed prairie dog colonies	Do not allow ground-disturbing activities within 660 feet of prairie dog colonies identified in prairie dog habitat (Note: the size of the habitat varies by alternative). No permanent aboveground facilities are allowed within the 660-foot buffer.	Exception: An exception may be granted if the Applicant submits a plan that indicates that impacts of the proposed action can be adequately mitigated or, if due to the size of the town, there is no reasonable location to develop a lease and avoid colonies the Field Manager will allow for loss of prairie dog colonies and/or habitat to satisfy terms and conditions of the lease.
BLM	Moab Field Office RMP	Within 660 feet of Gunnison prairie dog colonies	Do not allow ground-disturbing activities within 660 feet of prairie dog colonies identified in prairie dog habitat (Note: the size of the habitat varies by alternative). No permanent aboveground facilities are allowed within the 660-foot buffer.	Exception: An exception may be granted if the Applicant submits a plan that indicates that impacts of the proposed action can be adequately mitigated or, if due to the size of the town, there is no reasonable location to develop a lease and avoid colonies the Field Manager will allow for loss of prairie dog colonies and/or habitat to satisfy terms and conditions of the lease.
BLM	Vernal Field Office RMP	Within 660 feet of prairie dog colonies identified in prairie dog habitat in the Coyote Basin Complex (which includes the Coyote Basin, Kennedy Wash, Shiner, and Snake John	Do not allow ground-disturbing activities. No permanent aboveground facilities are allowed within the 660-foot buffer.	Exception: An exception may be granted if the Applicant submits a plan that indicates that impacts of the proposed action can be adequately mitigated or, if due to the size of the town, there is no reasonable location to develop a lease and avoid colonies the Field Manager will allow for loss of prairie dog colonies and/or habitat to satisfy terms

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
		subcomplexes) and the Myton Bench Complex.		and conditions of the lease. Modification: The Field Manager may modify the boundaries of the stipulation area if portions of the area does not include prairie dog habitat or active colonies are found outside the current defined area, as determined by the BLM. Waiver: May be granted if, in the leasehold, it is determined that habitat no longer exists or has been destroyed.
Colorado River Fishes				
BLM	Little Snake Field Office RMP	In critical or occupied habitat of Colorado pikeminnow (<i>Ptychocheilus lucius</i>), razorback sucker (<i>Xyrauchen texanus</i>), humpback chub (<i>Gila cypha</i>), and bonytail (<i>Gila elegans</i>).	Require no surface occupancy stipulations.	Exceptions that could adversely affect listed fish (such as bridge abutments) will require site-specific consultation with the FWS.
BLM	Moab Field Office RMP	Within the 100-year floodplain of the Colorado River, Green River, and at the confluence of the Dolores and Colorado rivers	No ground-disturbing activities will be allowed.	Any exceptions to this requirement will require consultation with the FWS. Restrictions on surface disturbance in this critical habitat will be developed through this consultation process.
Columbian Sharp-tailed Grouse				
BLM	Rawlins Field Office RMP	Within 0.25 mile of perimeter of occupied Colombian sharp-tailed grouse leks east of Wyoming Highway 789, south of Interstate 80, west of Wyoming Highway 71 and Carbon County Road 401, and north of Wyoming Highway 70	Prohibit surface disturbance/occupancy year round	None

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
BLM	Little Snake Field Office RMP	Within a 0.25-mile radius of a lek site	The no surface occupancy area may be altered depending upon the active status of the lek or the geographical relationship of topographical barriers and vegetation screening to the lek site.	None
Greater Sage-grouse				
State of Wyoming	Executive Order for Greater Sage-grouse in Wyoming, 2011	Within 0.6 miles of the perimeter of occupied sage-grouse leks	No surface occupancy. Other activities may be authorized with the application of appropriate seasonal stipulations, provided the resources protected by the no surface occupancy are not adversely affected.	Exceptions: Any exceptions to these general or specific stipulations will be considered on a case-by-case basis and must show that the exception will not cause declines in sage-grouse populations.
State of Wyoming	Executive Order for Greater Sage-grouse in Wyoming, 2011	Outside 0.6 miles of the perimeter of occupied sage-grouse leks	Transportation: Locate main roads used to transport production and/or waste products greater than 1.9 miles from the perimeter of occupied sage-grouse leks. Locate other roads used to provide facility site access and maintenance greater than 0.6 miles from the perimeter of occupied sage-grouse leks. Construct roads to minimum design standards needed for production activities. Overhead Lines: Bury lines when possible, if not; locate overhead lines at least 0.6 miles from the perimeter of occupied sage-grouse leks. New lines should be raptor proofed if not buried.	Exceptions: Any exceptions to these general or specific stipulations will be considered on a case-by-case basis and must show that the exception will not cause declines in sage-grouse populations.
Colorado Parks and Wildlife	Colorado Greater Sage-grouse Conservation Plan	Within a 0.6-mile radius area around a lek	On federal lands, the 0.6-mile radius area around a lek in breeding habitat could be defined as an area of no surface occupancy or avoidance area. Every possible opportunity to avoid or minimize the impact should be exhausted to prevent development in this area, but allowances	None

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
			are provided. The 4-mile radius is not a no surface occupancy or avoidance area. It is an area of consideration where the disturbance guidelines should be applied when, and if, possible.	
State of Utah	Conservation Plan for Greater Sage-grouse in Utah, 2013	Lek	▪ Avoid disturbance in the lek, if possible. The Applicant must demonstrate why avoidance is not possible. ▪ If avoidance is not possible, use minimization as appropriate to the lek. ▪ If minimization is not sufficient, mitigation is required. Mitigation should be calculated at a minimum of a 4:1 ratio starting with the first acre disturbed. Mitigation must produce lands capable of supporting greater sage-grouse as habitat before the proposed disturbance occurs, though birds do not need to be using the mitigated area. The Applicant of the disturbance must demonstrate that the conditions have been met. ▪ New permanent disturbance, including structures, fences, and buildings, should not be located in the lek itself. ▪ No permanent disturbance within 1 mile of the lek, unless it is not visible to the sage-grouse using the lek. ▪ Fences should not be located adjacent to leks where bird collisions would be expected to occur. If required, the construction of any fences near the lek should follow the standards identified	None

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
			in the NRCS fence collision risk tool (refer to NRCS/Conservation Effects Assessment Project Conservation Insight Publication <i>Applying the Sage Grouse Fence Collision Risk Tool to Reduce Bird Strikes</i> .) ■ A disturbance outside the lek should not produce noise that rises more than 10 decibels above the background level at the edge of the lek during breeding season.	
BLM	Little Snake Field Office RMP	Within a 0.6-mile radius of a lek site.	No surface occupancy	The no surface occupancy area may be altered depending upon the active status of the lek, habitat characteristics, or the geographical relationship of topographical barriers and vegetation screening to the lek site.
BLM	White River Field Office RMP	Within 0.25 mile of identified lek sites.	No surface occupancy	Exceptions, modifications, or waivers to this no surface occupancy stipulation may be granted by the Area Manager.
BLM	Vernal Field Office RMP	Within 0.25 mile of active sage grouse leks	No ground-disturbing activities year round.	None
BLM	Moab Field Office RMP	Within 0.5 mile of greater sage-grouse leks.	All ground-disturbing activities will be prohibited on a year-round basis.	Exception: An exception may be granted by the Field Manager if the operator submits a plan that demonstrates that impacts from the proposed action can be adequately mitigated. Modification: The Field Manager may modify the boundaries of the stipulation area if (1) portions of the area do not include lek sites, or (2) the lek site(s) have been completely abandoned or destroyed, or (3) occupied lek site(s) occur outside the current defined area; as determined by the BLM. Waiver: A waiver may be granted if there are no active lek site(s) in the leasehold and it is determined the site(s) have been completely abandoned or

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
				destroyed or occur outside current defined area, as determined by the BLM.
BLM	Price Field Office RMP	Within 0.5 mile of greater sage-grouse leks	No surface occupancy.	The BLM Authorized Officer can except, modify, or waive surface stipulations. BLM will coordinate as necessary with the appropriate agency or entity. A holder of a land-use authorization document can be excepted from the stipulation on a one-time basis. A modification can be a change in the language or provisions of a surface stipulation, either temporarily or permanently. A waiver permanently excepts the surface stipulation.
BLM	Richfield Field Office RMP	Within 0.5 mile of greater sage-grouse leks	No surface occupancy	Exception: An exception may be granted by the Field Manager if the operator submits a plan that demonstrates that impacts from the proposed action can be adequately mitigated. Modification: The Field Manager may modify the boundaries of the stipulation area if (1) portions of the area do not include lek sites, (2) the lek site(s) have been completely abandoned or destroyed, or (3) occupied lek site(s) occur outside the current defined area, as determined by the BLM. Waiver: A waiver may be granted if there are no active lek site(s) in the leasehold and it is determined the site(s) have been completely abandoned or destroyed or occur outside current defined area, as determined by the BLM.
BLM	Moab Field Office RMP	Within 0.5 miles of a lek in sage-grouse habitat	If greater sage-grouse leks are discovered in sage grouse habitat, no ground-disturbing activities will be allowed.	Exception: An exception may be granted by the Field Manager if the operator submits a plan that demonstrates that impacts from the proposed action can be adequately mitigated. Modification: The Field Manager may modify the boundaries of the stipulation area if (1) portions of the area do not include lek sites, or (2) the lek site(s) have been completely abandoned or destroyed, or (3) occupied lek site(s) occur outside the current defined

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
				area; as determined by the BLM. Waiver: A waiver may be granted if there are no active lek site(s) in the leasehold and it is determined the site(s) have been completely abandoned or destroyed or occur outside current defined area, as determined by the BLM.
BLM	Moab Field Office RMP	Within 0.6 miles of a lek	If Gunnison sage-grouse leks are discovered in sage-grouse habitat, no ground-disturbing activities will be allowed within 0.6 miles of a lek.	Exception: An exception may be granted by the Field Manager if the operator submits a plan that demonstrates that impacts from the proposed action can be adequately mitigated. Modification: The Field Manager may modify the boundaries of the stipulation area if (1) portions of the area do not include lek sites, or (2) the lek site(s) have been completely abandoned or destroyed, or (3) occupied lek site(s) occur outside the current defined area, as determined by the BLM. Waiver: A waiver may be granted if there are no active lek site(s) in the leasehold and it is determined the site(s) have been completely abandoned or destroyed or occur outside current defined area, as determined by the BLM.
Mexican Spotted Owl				
BLM	Little Snake Field Office RMP	All protected activity centers	No surface occupancy will be applied.	None
BLM	Moab Field Office RMP	Within 0.5 mile of identified nest site; in the designated protected activity center	Survey two consecutive years for owls according to established protocol prior to commencing of activity. If owls are found, no permanent actions will occur. If nest site is unknown, no activity will occur in the designated protected activity center.	None
BLM	Price Field Office RMP	Within 0.5 mile of known Mexican spotted owl nests	No surface occupancy.	The BLM Authorized Officer can except, modify, or waive surface stipulations. BLM will coordinate as necessary with the appropriate agency or entity. A

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
				holder of a land-use authorization document can be excepted from the stipulation on a one-time basis. A modification can be a change in the language or provisions of a surface stipulation, either temporarily or permanently. A waiver permanently excepts the surface stipulation.
BLM	Richfield Field Office RMP	If project activities occur within 0.5 mile of suitable owl habitat, dependent in part on if the action is temporary or permanent. (Note: Temporary activities are defined as those that are completed prior to the start of the following raptor breeding season, leaving no permanent structures and resulting in no permanent habitat loss. Permanent activities continue for more than one breeding season and/or cause a loss of owl habitat or displace owls through disturbances [e.g., creation of a permanent structure including but not limited to well pads, roads, pipelines, electrical power line]).	Temporary: If action occurs entirely outside of the owl breeding season, and leaves no permanent structure or permanent habitat disturbance, action can proceed without an occupancy survey: ▪ If action will occur during a breeding season, survey for owls prior to commencing activity. If owls are found, activity should be delayed until outside of the breeding season. ▪ Eliminate access routes created by a project through such means as raking out scars, revegetation, gating access points, etc. For all permanent actions that may impact owls or suitable habitat ▪ Permanent: Survey two consecutive years for owls according to established protocol prior to commencing of activity. ▪ If owls are found, no actions will occur within 0.5 mile of identified nest site. ▪ If nest site is unknown, no activity will occur in the designated protected activity center. ▪ Avoid placing permanent structures within 0.5 mile of suitable habitat unless surveyed and not occupied.	None

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
			▪ Reduce noise emissions (e.g., use hospital-grade mufflers) to 45 A-weighted decibels at 0.5 mile from suitable habitat, including canyon rims. Placement of permanent noise-generating facilities should be determined by a noise analysis to ensure noise does not encroach upon a 0.5-mile buffer for suitable habitat, including canyon rims. ▪ Limit disturbances to and in suitable owl habitat by staying on designated routes. ▪ Limit new access routes created by the project. Prior to ground-disturbing activities in Mexican spotted owl protected activity centers, breeding habitats, or designated critical habitat, specific principles should be considered to control erosion.	
Mountain Plover				
BLM	Little Snake Field Office RMP	Within 0.125 mile around all plover nest sites	No surface occupancy stipulations. The boundaries of the stipulated area may be modified if the Authorized Officer determines that surface occupancy will not harm the integrity of the nest or nest location. Implement controlled surface use and timing stipulation during breeding season.	None
Southwestern Willow Flycatcher				
BLM	Moab Field Office RMP	Within 300 feet of suitable riparian habitat	Activities will maintain a 300-foot buffer from suitable riparian habitat year long.	Exception: An exception may be granted by the Field Manager if authorization is obtained from FWS (through applicable provisions of the Endangered Species Act [ESA]). The Field Manager may also

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
				grant an exception if an environmental analysis indicates that the nature of the conduct of the actions, as proposed or conditioned, will not impair the primary constituent element determined necessary for the survival and recovery of the southwestern willow flycatcher, and FWS concurs with this determination. Modification: The Field Manager may modify the boundaries of the stipulation area if an environmental analysis indicates, and FWS (through applicable provisions of the ESA) determines that a portion of the area is not being used as southwestern willow flycatcher habitat. Waiver: May be granted if the southwestern willow flycatcher is de-listed and if FWS determines it is not necessary for the survival and recovery of the southwestern willow flycatcher.
Western Yellow-billed Cuckoo				
BLM	Little Snake Field Office RMP	Within 0.25 mile of any suitable yellow-billed cuckoo habitat	Prohibit permanent ground-disturbing activities (no surface occupancy)	Exceptions should be evaluated on a case-by-case basis to avoid adverse impacts.
BLM	Moab Field Office RMP	Within 100 meters of yellow-billed cuckoo habitat	No ground-disturbing activities will be conducted within 100 meters of yellow-billed cuckoo habitat (riparian areas) from May 15 through July 20.	Exception: An exception may be granted by the Field Manager if authorization is obtained from FWS (through applicable provisions of the ESA). The Field Manager may also grant an exception if an environmental analysis indicates that the nature of the conduct of the actions, as proposed or conditioned, will not impair the primary constituent element determined necessary for the survival and recovery of the yellow-billed cuckoo.
Big Game				
Elk				
BLM	Grand Junction Field Office RMP	Elk calving areas	Prohibit surface disturbance in these areas year round. The decision to protect	None

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
			habitats by placing stipulation on disturbance type activities will be implemented by comparing activities proposed with areas identified for protective management. Applicable stipulations will be placed on projects that lie in the protected areas.	
Bighorn Sheep				
BLM	Moab Field Office RMP	In desert bighorn lambing grounds and migration corridors	No ground-disturbing activities are allowed	Exception: Within migration corridors, pipeline and road construction and geophysical exploration for oil and gas development would be allowed from June 16 through October 14 and from December 16 through March 31. The Field Manager may also grant an exception if the operator submits a plan that demonstrates that impacts from the proposed action can be adequately mitigated. Modification: The Field Manager may modify the boundaries of the stipulation area if a portion of the area is (1) not being used as desert bighorn lambing grounds or migration corridors (2) if habitat is being utilized outside of stipulation boundaries for and needs to be protected. Waiver: A waiver may be granted if the habitat is determined as unsuitable for lambing or migration and there is no reasonable likelihood of future use as desert bighorn lambing and/or rutting grounds and migration corridors.
Raptors				
Active Nests				
Colorado Parks and Wildlife	Colorado Division of Wildlife Raptor Guidelines 2008	Within 0.25 mile of active raptor nests	No surface occupancy	With the exception of the species listed specifically identified in plan

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
BLM	Rawlins Field Office RMP	Within 825 feet of active raptor nests	Well locations, roads, ancillary facilities, and other surface structures requiring a repeated human presence will not be allowed. Distance may vary depending on factors such as nest activity, species, natural topographic barriers, and line-of-sight distances.	None
BLM	Little Snake Field Office RMP	Within 0.25 mile of raptor nests	No surface occupancy	The no surface occupancy area could be altered depending upon the active status of the nest site or upon the geographical relationship of topographical barriers and vegetation screening to the nest site.
BLM	Moab Field Office RMP	In the spatial buffer of active raptor nest	Land use activities that would have an adverse impact on an occupied raptor nest, would not be allowed	None
Raptor Nests – Listed and Candidate Threatened/Endangered Species, BLM Sensitive Species				
BLM	White River Field Office RMP	Within 0.25 mile of identified nests	No surface occupancy	Exceptions, modifications, or waivers to this no surface occupancy stipulation may be granted by the Area Manager.
Raptor Nests – Other Than Special Status Raptors				
BLM	White River Field Office RMP	Within 0.125 mile of identified nests	No surface occupancy	Exceptions, modifications, or waivers to this no surface occupancy stipulation may be granted by the Area Manager.
Bald Eagle Nocturnal Roost and/or Concentration Areas				
BLM	Little Snake Field Office RMP	Within a 0.25-mile radius of roost sites and both occupied and unoccupied nests	Year-round no surface occupancy will be applied	None
BLM	Little Snake Field Office RMP	Within 100-meter radius of abandoned nests	No surface occupancy within a 100-meter radius of abandoned nests (unoccupied for 5 consecutive years, but with all or part of the nest remaining)	None
BLM	Little Snake Field Office RMP	Winter conservation areas	Prohibit any activity on BLM lands that has the potential to kill perch trees or impede use of foraging areas.	None

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
BLM	White River Field Office RMP	Bald eagle roost/concentration areas within 0.25 mile of designated features	No surface occupancy	Exceptions, modifications, or waivers to this no surface occupancy stipulation may be granted by the Area Manager.
BLM	Moab Field Office RMP	Within 1.0 mile of bald eagle nest sites or within 0.5 mile of bald eagle winter concentration areas	No permanent infrastructure. Permanent activities continue for more than one breeding season and/or cause a loss of habitat or displace individuals through disturbance (e.g., creation of a permanent structure including but not limited to well pads, roads, pipelines, electrical power line).	None
BLM	Moab and Richfield Field Office RMP	Bald eagle conservation measures	Power lines will be built to standards and guidelines identified by the Avian Protection Plan Guidelines.	None
BLM	Richfield Field Office RMP	Within 1 mile of bald eagle nest sites or within 0.5 mile of bald eagle winter concentration areas (roosts)	No permanent structures	None
Golden Eagle				
BLM	Moab Field Office RMP	Golden eagle nest sites and territories	No ground-disturbing activities will be allowed within a 0.5-miles radius of documented golden eagle nest sites in nesting territories from February 1 to July 15 or until fledgling and dispersal of young. Any access created by the action will be outside of nesting season and will be eliminated once action is complete.	Exception: An exception may be granted by the Field Manager if authorization is obtained from FWS and Utah Division of Wildlife Resources. The Field Manager may also grant an exception if an environmental analysis indicates that the nature or the conduct of the actions, as proposed or conditioned, will not impair the primary constituent element determined necessary for the survival and recovery of the golden eagle. Modification: The Field Manager may modify the boundaries of the stipulation area if an environmental analysis indicates and FWS and Utah Division of Wildlife Resources determine a portion of the area is not being used as golden eagle nesting territories.

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
				Waiver: A waiver may be granted if an individual golden eagle nest has been inactive (unoccupied) for at least a period of 3 years. Nest-monitoring data for a 3-year period will be required before the waiver could be granted.
Ferruginous Hawk				
Colorado Parks and Wildlife	Colorado Division of Wildlife Raptor Guidelines 2008	Within 0.5 mile of ferruginous hawk nests	No surface occupancy	None
BLM	Rawlins Field Office RMP	Within 1,200 feet of active ferruginous nests	Well locations, roads, ancillary facilities, and other surface structures requiring a repeated human presence will not be allowed. Distance may vary depending on factors such as nest activity, species, natural topographic barriers, and line-of-sight distances.	None
Mexican Spotted Owl				
BLM	Little Snake Field Office RMP	All protected activity centers	No surface occupancy will be applied	None
BLM	Moab Field Office RMP	Within 0.5 mile of an identified site; in the designated current and historic protected activity center.	If owls are found, no disturbing actions will occur within 0.5 mile of an identified site. If nest site is unknown, no activity will occur in the designated current and historic protected activity center.	None
Northern Goshawk				
Colorado Parks and Wildlife	Colorado Division of Wildlife Raptor Guidelines 2008	Within 0.5 mile of northern goshawk nests	No surface occupancy	None

TABLE E-15 NO SURFACE OCCUPANCY AND NO SURFACE DISTURBANCE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
Red-tailed Hawk				
Colorado Parks and Wildlife	Colorado Division of Wildlife Raptor Guidelines 2008	Within 0.33 mile of red-tailed hawk nests	No surface occupancy	None
Peregrine Falcon				
Colorado Parks and Wildlife	Colorado Division of Wildlife Raptor Guidelines 2008	Within 0.5 mile of peregrine falcon nests	No surface occupancy	None
BLM	Little Snake Field Office RMP	Within a 0.25 mile radius of cliff nesting complexes	No surface occupancy will be allowed.	No surface occupancy areas may be altered depending upon the active status of the nesting complex or upon the geographical relationship of topographical barriers and vegetation screening.
Prairie Falcon				
Colorado Parks and Wildlife	Colorado Division of Wildlife Raptor Guidelines 2008	Within 0.5 mile of prairie falcon nests.	No surface occupancy	None
Waterfowl				
Waterfowl and Shorebird Significant Production Areas				
BLM	Little Snake Field Office RMP	Waterfowl habitat management areas and rookeries	No surface occupancy will be allowed on significant production areas, such as waterfowl habitat management areas and rookeries.	No surface occupancy areas may be altered, depending upon the active status of the production areas or upon the geographical relationship of topographical barriers and vegetation screening.
BLM	Salt Lake Field Office RMP	In waterfowl habitat (i.e., marsh and wetland areas)	BLM will protect important wildlife habitat values from disturbing activities by restricting seismic work, well development, new road construction, rights-of-way, and other disturbing activities, excluding maintenance activities.	Specific exceptions may be granted by BLM if the proposed activity will not seriously disturb the wildlife habitat values being protected.

TABLE E-16 CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
Wetlands and Riparian Areas				
Bureau of Land Management (BLM)	Rawlins Field Office Resource Management Plan (RMP)	- Identified 100-year floodplains; - areas within 500 feet of perennial waters, springs, and wetland and riparian areas; and - areas within 100 feet of the inner gorge of ephemeral channels.	Ground-disturbing activities will be avoided.	Exceptions to this will be granted by the BLM based on an environmental analysis and site-specific engineering and mitigation plans. Only those actions in areas that cannot be avoided and that provide protection for the resource identified will be approved.
BLM	Grand Junction Field Office RMP	Palisade and Grand Junction municipal watersheds and the Jerry Creek Reservoirs	Limit ground-disturbing activities	None
BLM	Salt Lake Field Office RMP	Within 1,200 feet of riparian/aquatic habitats	Avoid to the maximum extent possible: Lands within 1,200 feet of riparian/aquatic habitats.	Specific exceptions may be granted by BLM if the proposed activity will not seriously disturb the wildlife habitat values being protected.
Soils				
BLM	White River Field Office RMP	Fragile soils on slopes greater than 35 percent and saline soils derived from Mancos shale	Ground-disturbing activities will be allowed in these areas only after an engineered construction/reclamation plan is submitted by the operator and approved by the Field Manager. The following items must be addressed in the plan: - how soil productivity will be restored; and - how surface runoff will be treated to avoid accelerated erosion such as riling, gullyng, piping, and mass wasting.	Exception: An exception may be granted by the Field Manager if an environmental analysis of the proposed action identifies that the scale of the operation would not result in any long term decrease in site productivity or increased erosion. An exception may also be granted by the Field Manager if a more detailed soil survey determines that soil properties associated with the disturbance do not meet fragile soil criteria. Modification: None. Waiver: None.

TABLE E-16
CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES
FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS

Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
BLM	Price Field Office RMP	Slopes between 20 and 40 percent	In ground-disturbing proposals regarding construction on slopes of 20 percent to 40 percent, include an approved erosion control strategy and topsoil segregation/restoration plan. Such construction must be properly surveyed and designed by a certified engineer and approved by the BLM prior to project implementation, construction, or maintenance.	Exception: If after an environment analysis the Authorized Officer determines that it would cause undue or unnecessary degradation to pursue other placement alternatives; surface occupancy in the area may be authorized. In addition, a plan from the operator and BLM's approval of the plan would be required before construction and maintenance could begin. The plan must include: • An erosion control strategy • GIS modeling • Proper survey and design by a certified engineer. Modification: Modifications also may be granted if a more detailed analysis, e.g., Order I soil survey conducted by a qualified soil scientist, finds that surface disturbance activities could occur on slopes between 20 and 40 percent while adequately protecting areas from accelerated erosion. Waiver: None
BLM	Rawlins Field Office RMP		Avoid construction with frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur.	Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the Authorized Officer.

TABLE E-16 CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
Special Status Plants				
Rare Plant and Rare Plant Community Occurrences in Natural Systems				
BLM	Little Snake Field Office RMP	Rare plant and rare plant community in Limestone Ridge and Lookout Mountain	Avoidance areas for ground-disturbing activities: All disruptive activities will be delayed until specific protective measures are developed and implemented, if appropriate.	BLM
BLM	Grand Junction Field Office RMP	Significant known sites	The decision to protect habitats by placing stipulations on disturbance type activities will be implemented by comparing activities proposed with areas identified for protective management. Applicable stipulations will be placed on projects that lie in the protected areas.	None
Clay Phacelia				
U.S. Forest Service (USFS)/U.S. Fish and Wildlife Service (FWS)	Clay phacelia conservation measures	Within 200 feet of suitable habitat	No mechanical vegetation treatments	None
USFS/FWS	Clay phacelia conservation measures	Within 650 feet of suitable habitat	No construction of roads or disturbance from construction of poles, pads, towers, and other permanent features	If avoidance of suitable habitat is not possible, cumulative disturbance will not exceed 10 percent. Mitigation measures will be necessary for any disturbance in clay phacelia suitable habitat. The following measures will also be followed for any disturbance in clay phacelia suitable habitat: Clearance surveys should be conducted following the development of the construction footprint and prior to construction in order to determine species presence.

TABLE E-16
CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES
FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS

Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
				▪ All project employees, especially contractors, brought onsite for the duration of a project will be informed of the occurrence of clay phacelia in the project area and of the endangered status of the species. All project employees shall be advised as to the potential penalties (up to \$200,000 in fines and one year in prison) for damaging, destroying or removing and possessing a plant species on federal lands listed under the Act. A qualified biologist is required to perform this instruction. ▪ A qualified botanist should be on-site during all ground disturbing activities to ensure plants are identified and avoided in suitable habitat. If any activity, development, or ground disturbance (even if temporary) occurs in clay phacelia modeled habitat, the following measures shall be considered: ▪ Acquisition of occupied habitat and placement into permanent conservation ▪ Successful introduction of clay phacelia into new sites on USFS land (up to 5 sites where presence of flowering adults occurs for a period of 5 years)

TABLE E-16
CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES
FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS

Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
				▪ Fencing of existing and suitable sites to protect from herbivores ▪ Contribution to a fund for ongoing management of populations and protection (e.g., fencing, caging, control of herbivores) of occupied habitat The following measures will be considered and weighted into the final mitigation calculation: ▪ Amount of modeled habitat disturbed and proximity to occupied habitat ▪ Type of disturbance: permanent development, temporary development, temporary construction activity, intermittent activity ▪ Amount of time of disturbance: 1 month or less, up to 6 months, up to 1 year, more than 1 year or continuous ▪ Habitat fragmentation: Location and spacing of transmission lines from each other and other development.
USFS/FWS	Clay phacelia conservation measures	Within 2,500 feet of suitable habitat	No on-the-ground herbicide treatments. No aerial herbicide treatments.	None

TABLE E-16 CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
USFS/FWS	Clay phacelia conservation measures	In clay phacelia suitable habitat	No ground disturbance from the stringing of wire between towers. Wire should be strung between towers aerially. A vegetation management plan should be developed that outlines methods for control of invasive, exotic species in greater detail while protecting clay phacelia and its habitat. A wildfire mitigation plan should be developed to prevent suitable habitat from being impacted by emergency fire operations in the event of a wildfire. All equipment should be cleaned and inspected for presence of invasive, non-native plants and seeds before being brought in suitable habitat.	None
Jones' Cycladenia				
BLM	Moab Field Office RMP	Potential, suitable, and occupied habitat. Potential, suitable, and occupied habitat are defined as follows: Potential habitat is defined as areas that satisfy the broad criteria of the species habitat description; usually determined by preliminary, in-house assessment. Suitable habitat is defined as areas that contain or exhibit the specific components or constituents necessary for plant persistence; determined by field inspection and/or surveys; may or may not contain clay reed-mustard; habitat descriptions can be found in the <i>Federal Register</i> Notice and species recovery plan links at	Current avoidance and minimization measures include the following: - Pre-project habitat assessments will be completed across 100 percent of the project disturbance area in potential habitat prior to any ground disturbing activities to determine if suitable Jones cycladenia habitat is present. - Site inventories will be conducted in suitable habitat to determine occupancy. Where standard surveys are technically infeasible and otherwise hazardous due to topography, slope, etc., suitable habitat will be assessed and mapped for avoidance (hereafter, "avoidance areas"); in such cases, in general, 300-foot buffers will be maintained between surface disturbance and avoidance areas. However, site-specific	None

TABLE E-16
CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES
FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS

Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
		http://www.fws.gov/endangered/wildlife.html >. Occupied habitat is defined as areas currently or historically known to support clay reed-mustard; synonymous with “known habitat.”	distances will need to be approved by FWS and BLM when disturbance will occur upslope of the habitat. Where conditions allow, inventories: • Must be conducted by qualified individual(s) and according to BLM- and FWS-accepted survey protocols; • Will be conducted in suitable and occupied habitat for all areas proposed for surface disturbance prior to initiation of project activities and in the same growing season, at a time when the plant can be detected (usually May 15 to June 30, however, surveyors should verify that the plant is flowering by contacting a BLM or FWS botanist or demonstrating that the nearest known population is in flower); • Will occur within 300 feet from the centerline of the proposed right-of-way for surface pipelines or roads; and within 300 feet from the perimeter of disturbance for the proposed well pad including the well pad; • Will include, but not be limited to, plant species lists and habitat characteristics; and • Will be valid until May 1 the following year. ■ Design project infrastructure to minimize impacts in suitable habitat: • Where standard surveys are technically infeasible, infrastructure and activities will avoid all suitable habitat (avoidance areas) and incorporate 300-foot buffers, in general; however, site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat;	

TABLE E-16
CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES
FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS

Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
			• Reduce well pad size to the minimum needed, without compromising safety; • Where technically and economically feasible, use directional drilling or multiple wells from the same pad; • Limit new access routes created by the project; • Roads and utilities should share common right-of-ways where possible; • Reduce the width of right-of-ways and minimize the depth of excavation needed for the road bed; where feasible, use the natural ground surface for the road in habitat; • Place signing to limit off-road travel in sensitive areas; • Stay on designated routes and other cleared/approved areas; and • All disturbed areas will be revegetated with native species comprised of species indigenous to the area and non-native species that are not likely to invade other areas. ■ In occupied habitat, project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts on populations and to individual plants: • Follow the above recommendations for Project design in suitable habitats; • To avoid water flow and/or sedimentation into occupied habitat and avoidance areas, silt fences, hay bales, and similar structures or practices will be incorporated into the project design; appropriate placement of fill is encouraged;	

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Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
			• Construction of roads will occur such that the edge of the right of way is at least 300 feet from any plant and 300 feet from avoidance areas; • Roads will be graveled in occupied habitat; the operator is encouraged to apply water for dust abatement to such areas from May 15 to June 30 (flowering period); dust abatement applications will be comprised of water only; • The edge of the well pad should be located at least 300 feet away from plants and avoidance areas, in general; however, site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat; • Surface pipelines will be laid such that a 300-foot buffer exists between the edge of the right of way and plants and 300 feet between the edge of right of way and avoidance areas; use stabilizing and anchoring techniques when the pipeline crosses suitable habitat to ensure pipelines don't move towards the population; site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat; • Construction activities will not occur from May 15 through June 30 in occupied habitat; • Before and during construction, areas for avoidance should be visually identifiable in the field, e.g., flagging, temporary fencing, rebar, etc.; • Place produced oil, water, or condensate	

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CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES
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Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
			tanks in centralized locations, away from occupied habitat; and • Minimize the disturbed area of producing well locations through interim and final reclamation. Reclaim well pads following drilling to the smallest area possible. ▪ Occupied Jones cycladenia habitats within 300 feet of the edge of the surface pipelines' right of ways, 300 feet of the edge of the roads' right of ways, and 300 feet from the edge of the well pad shall be monitored for a period of 3 years after ground disturbing activities. Monitoring will include annual plant surveys to determine plant and habitat impacts relative to project facilities. Annual reports shall be provided to the BLM and FWS. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and the FWS. ▪ Reinitiation of Section 7 consultation with the FWS will be sought immediately if any loss of plants or occupied habitat for the Jones' cycladenia is anticipated as a result of project activities. Additional site-specific measures may also be employed to avoid or minimize effects on the species. These additional measures will be developed and implemented in consultation with the FWS to ensure continued compliance with the Endangered Species Act (ESA).	

TABLE E-16 CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
Ute Ladies'-tresses				
BLM	Little Snake Field Office RMP	0.25 miles from any known Ute ladies'-tresses orchid habitat	All proposed right-of-way projects (power lines, pipelines, roads, etc.) will be designed and locations selected to minimize disturbances. If avoidance of adverse effects is not possible, the BLM will re-initiate consultation with the FWS.	None
BLM	Little Snake Field Office RMP	In occupied or suitable habitat	Ground-disturbing activities would be preceded by a current year survey and a separate Section 7 consultation.	None
BLM	Richfield Field Office RMP	Occupied Ute ladies'-tresses habitats within 300 feet of the edge of the surface pipelines' rights-of-way, 300 feet of the edge of the roads' rights-of-way, and 300 feet from the edge of the well pad	Occupied habitat shall be monitored for a period of 3 years after ground-disturbing activities. Monitoring will include annual plant surveys to determine plant and habitat impacts relative to project facilities. Habitat impacts include monitoring any changes in hydrology due to Project-related activities. Annual reports shall be provided to the BLM and FWS. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and FWS.	None
Special Status Wildlife Species				
BLM	Grand Junction Field Office RMP	Standard designs for power line projects	Structure holes left open overnight shall be covered. Covers shall be secure and strong enough to prevent livestock or wildlife from falling into holes.	None
BLM	Grand Junction Field Office RMP	Standard designs for power line projects	Holder shall not blade or excavate to prepare a structure framing pad. If a structure cannot be framed on the natural ground, aerial framing or off-site framing will be necessary.	None
BLM	Little Snake Field Office RMP	All special status wildlife	- Minimize width of field surface roads. - Avoid engineered and graveled roads when possible to reduce the footprint.	None

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CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES
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Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
			▪ Reduce the long-term footprint of facilities to the smallest practical space. ▪ Design and construct roads to minimize duplication of them. ▪ Cluster development of roads, pipelines, electric lines, and other facilities, and use existing, combined corridors where possible.	
BLM	Richfield Field Office RMP	Standard designs for power line projects	▪ Ensure rights-of-way and utility corridors use areas adjoining or adjacent to previously disturbed areas whenever possible. • Stabilize disturbed areas in road rights-of-way and utility corridors with vegetation practices designed to hold soil in place and minimize erosion. Reestablish vegetation cover to increase infiltration and provide additional protection from erosion. • Construct sediment barriers when needed to slow runoff, allow deposition of sediment, and prevent transport from the site. Straining or filtration mechanisms may also be employed for the removal of sediment from runoff.	None
BLM	Fillmore Field Office RMP	Standard designs for power line projects	▪ The road or highway in the right-of-way corridor shall be used to the maximum extent possible for construction and maintenance of new rights-of-way. ▪ Roads that are needed for construction of a new right-of-way shall be temporary and fully rehabilitated. ▪ All land disturbed by new rights-of-way except authorized new access roads shall be rehabilitated to as close to natural conditions as possible.	None

TABLE E-16 CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
			▪ Transmission line rights-of-way shall be adjacent to each other or as close as possible. ▪ New rights-of-way shall be limited to below the surface of the ground uses only. ▪ Existing transmission line access roads shall be used, and only the roads to new tower sites shall be constructed for new right-of-way. ▪ All rights-of-way must comply with the applicable Visual Resource Management classes.	
BLM	Salt Lake Field Office RMP	Standard designs for power line projects	Rights-of-way, whether inside or outside a corridor, will avoid the following areas to the maximum extent possible: ▪ Lands within 0.5 mile of sage grouse strutting grounds if the disturbance would adversely impact the effectiveness of the lek. ▪ Lands within 1,200 feet of riparian/aquatic habitats. ▪ Lands in Visual Resource Management Class II and III areas. ▪ Lands in wilderness study areas. ▪ Lands where an above-ground right-of-way would be an obvious visual or physical intrusion such as ridge tops or narrow drainages. ▪ Lands with slopes greater than 30 percent. ▪ Lands with known or suspected hazardous materials. In addition, construction activities would not be allowed in the crucial seasons and habitats for mule deer, elk, pronghorn, bald eagles, and other raptors.	Exceptions may be permitted based on consideration of the following criteria: ▪ a type and need for facility proposed and economic impact of facility; ▪ conflicts with other resource values and uses; and ▪ availability of alternative routes and/or mitigation

TABLE E-16 CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
Black-footed Ferret				
BLM	Rawlins Field Office RMP	Within 164 feet (50 meters) of a prairie dog town	If prairie dog towns/complexes suitable as black-footed ferret habitat are present, attempts will be made to avoid locating ground-disturbing activities.	None
BLM	Little Snake Field Office RMP	Active white-tailed prairie dog colonies in the black-footed ferret reintroduction area.	Avoidance areas for ground-disturbing activities. Right-of-ways on public land with the potential to disturb occupied black-footed ferret habitat will be rerouted to avoid those prairie dog towns.	None
BLM	Little Snake Field Office RMP	Prairie dog towns	Rights-of-way on public land with the potential to disturb occupied black-footed ferret habitat will be rerouted to avoid those prairie dog towns.	None
BLM	Little Snake Field Office RMP	Potential habitat	In areas where black-footed ferret occupancy is suspected or where surveys have not cleared the area, spotlighting surveys would be required prior to ground disturbing activities.	None
BLM	Little Snake Field Office RMP	Occupied black-footed ferret habitat	Avoidance areas for new rights-of-way	None
BLM	White River Field Office RMP	Ferret reintroduction area	Prior to authorizing activities in this area, the Area Manager will confer or consult with the FWS as required by Section 7 of the ESA. Depending on the scope of the proposed action, a plan of development may be required that demonstrates how the proposed activities would be conducted or conditioned to: ▪ avoid the direct or indirect loss of black-footed ferrets; or ▪ avoid affecting the capability of the site to achieve reestablishment objectives. The Area Manager may impose land use measures and limitations derived from a site specific ferret reintroduction and management plan. The	Exception: The Area Manager may authorize surface disturbance or use in these areas if an environmental analysis, and associated biological assessment, finds that the activity as proposed of conditioned, would not adversely influence ferret recovery, or conflict with the ferret reintroduction and conditioned, would not adversely influence ferret recovery, or conflict with the ferret reintroduction and management plan. Modification: The Area Manager may modify the terms of the

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			measures and limitations would be designed to avoid, or reduce to acceptable levels, the short and long term adverse effects on ferret survival, behavior, reproductive activities, and/or the area's capacity to sustain ferret population objectives. Examples of measures and limitations include: ▪ relocation of surface activities more than 200 meters; ▪ deferring activities longer than 60 days; ▪ limiting access to designated roads and trails; ▪ modifications to project design to discourage raptor perching and prohibit the disruption of certain or all prairie dog burrow systems; ▪ limit surface disturbance to certain seasons and times of day; and ▪ require participation in ferret surveys and/or efforts to offset losses of, or expand suitable prairie dog habitats to compensate for unavoidable habitat loss or adverse habitat modification.	controlled-surface use if the proposed action is shown to be compatible with ferret recovery goals and/or, the ferret reintroduction and management plan. Waiver: The Area Manager may grant a waiver if extirpation of wild, free roaming ferret populations culminates in the discontinuance of the species recovery program, or local reintroduction efforts are otherwise abandoned.
White-tailed Prairie Dog				
BLM	Rawlins Field Office RMP	In white-tailed and black-tailed prairie dog towns	Ground-disturbing and disruptive activities will be avoided.	None
BLM	Rawlins Field Office RMP	In prairie dog towns	Placement of power poles will be avoided; however, in the event that power poles are required to be placed in these towns, raptor anti-perch devices will be required.	None
BLM	White River Field Office RMP	Prairie dog towns	Lands in this lease parcel involve prairie dog ecosystems that constitute potential habitat for wild or reintroduced populations of the federally endangered black-footed ferret. Conservation and recovery efforts for the black-footed ferret are authorized by the ESA (as amended). The successful lessee may be required to perform special	None

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			conservation measures prior to and during lease development. These measures may include one or more of the following: ▪ Performing site-specific habitat analysis and/or participating in ferret surveys. ▪ Participating in the preparation of a surface use plan of operations with BLM, FWS, and Colorado Division of Wildlife, which integrate and coordinate long-term lease development with measures necessary to minimize adverse impacts on black-footed ferrets or their habitat. ▪ Abiding by special daily and seasonal activity restrictions on construction, drilling, product transport, and service activities. ▪ Incorporating special modifications to facility siting, design, construction, and operation. ▪ Providing in-kind compensation for habitat loss and/or displacement (e.g, special on-site rehabilitation/revegetation measures or off-site habitat enhancement).	
Colorado River Fishes				
BLM	White River Field Office RMP	Colorado River cutthroat trout habitat	This is a controlled surface use area for protecting aquatic habitats occupied by candidate populations of Colorado River cutthroat trout. Prior to authorizing surface disturbance of occupied stream reaches or in watersheds contributing to occupied habitats, the Area Manager may require the Applicant to submit a plan of development that would demonstrate that the proposed action would not: ▪ increase stream gradient; ▪ result in a net increase in sediment contribution; ▪ decrease stream channel sinuosity;	Exception: The Area Manager may authorize surface disturbance in these areas if an environmental analysis indicates that the project would have no adverse influence on identified stream characteristics. Modification: Short term transgressions of the stream characteristics listed above may be allowed if the Area Manager determines, through environmental analysis, that short term deviations will have no adverse consequences

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			■ increase the channel width to depth ratio; ■ increase water temperature; ■ decrease vegetation derived stream shading; and ■ degrade existing water quality parameters, including specific conductance, turbidity, organic/inorganic contaminant levels, and dissolved oxygen in occupied reaches or contributing perennial or intermittent tributaries. If approvals are granted and development results in these standards being exceeded, additional measures would be required to correct the deficiencies. The Applicant may be required to monitor stream/channel responses throughout the life of the project.	on affected channel reaches beyond the construction phase of the project. Waiver: In the event the population status of Colorado River cutthroat trout warrants downgrading, this stipulation may be replaced by less stringent criteria.
BLM	Little Snake Field Office RMP	All new pipelines and other controlled surface uses crossing any critical or occupied habitat of the Colorado River fishes	Controlled-surface uses crossing any critical or occupied habitat of the Colorado River fishes will require separate Section 7 consultation.	None
BLM	Little Snake Field Office RMP	All new pipelines and other controlled surface uses crossing any critical or occupied habitat of the Colorado River fishes	After construction, the stream bed will be returned to preconstruction contours	None
BLM	Moab and Richfield Field Office RMP	Within 0.25 mile of the channel centerline of the Colorado, Green, Duchesne, Price, White, and San Rafael rivers	Ground-disturbing activities will be restricted.	None
BLM	Moab Field Office RMP	In floodplains or riparian areas	Ground-disturbing activities will be avoided unless there is no practical alternative or the development would enhance riparian/aquatic values. If activities must occur in these areas, construction will be designed to include mitigation efforts to maintain, restore, and/or improve riparian and aquatic conditions. If conditions could	None

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			not be maintained, offsite mitigation strategies should be considered.	
Columbian Sharp-tailed Grouse				
BLM	Rawlins Field Office RMP	Within 0.25 to 1 mile of an occupied sharp-tailed grouse lek	High-profile structures (e.g., buildings, storage tanks, overhead power lines, wind turbines, towers, windmills) will be authorized on a case-by-case basis.	None
Greater Sage-grouse				
State of Wyoming	Executive Order for Greater Sage-grouse in Wyoming, 2011	Suitable sage-grouse habitat	Surface disturbance will be limited to 5 percent of suitable sage-grouse habitat per an average of 640 acres. The density of disturbance calculation tool process will be used to determine the level of disturbance. Distribution of disturbance may be considered and approved on a case-by-case basis. Unsuitable habitat should be identified in a seasonal and landscape context, on a case-by-case basis, outside the 0.6-mile buffer around leks.	Exceptions: Any exceptions to these general or specific stipulations will be considered on a case by case basis and must show that the exception will not cause declines in sage-grouse populations.
Colorado Parks and Wildlife	Colorado Greater Sage-grouse Conservation Plan	Lek habitat	Power lines (transmission, service lines) – Whenever possible, avoid the construction of power lines in lek habitat. If impractical, power lines in lek habitat should be retro-fitted to deter raptor perching. If practical, power lines should be constructed to reduce the likelihood of grouse-wire collisions. Similar adjustments should be applied to existing power lines where grouse mortality issues have been identified. Roads and Trails – Avoid constructing roads and trails in lek habitat. If unavoidable, roads should be placed so they, and their associated traffic, are not in direct line-of-sight of strutting males. Vehicles should not exceed 30 to 40 mph during the strutting period to avoid grouse-vehicle collisions. Roads should be minimally developed and seasonal closures should be developed.	None

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Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
Colorado Parks and Wildlife	Colorado Greater Sage-grouse Conservation Plan	Breeding habitat – nesting and early brood-rearing habitat, summer-fall habitat, and winter habitat	Power lines – If possible, power lines should be avoided in these seasonal habitats. If not possible, consider burying power lines, placing raptor perching deterrents, and avoiding areas where sage-grouse concentrate, riparian areas, or areas where collisions or predatory events from perching raptors have been documented. Roads and Trails – Vehicles should not exceed 30 to 40 mph on local or unpaved roads.	None
State of Utah	Conservation Plan for Greater Sage-grouse in Utah, 2013	Transmission corridors	▪ Apply mitigation standards based on habitat type as discussed in the Management Protocol, and best management practices accepted by industry and state and federal agencies. ▪ For electrical transmission lines, and where feasible and consistent with federally required electrical separation standards, site new linear transmission features in existing corridors, or at a minimum, in concert with existing linear features in greater sage-grouse habitat. Siting linear features accordingly shall be deemed to be mitigation for the siting.	None
State of Utah	Conservation Plan for Greater Sage-grouse in Utah, 2013	Nesting and brood-rearing area (i.e., habitat within a 3-mile radius of the lek; and winter habitat; and other habitat [Note: Other habitat refers to habitat in sage-grouse management areas that is not part of the lek, nesting, or wintering areas]).	• Avoid disturbance in nesting and brood-rearing area, if possible. The Applicant must demonstrate why avoidance is not possible. • If avoidance is not possible, use minimization as appropriate in the nesting and brood rearing area. • If minimization is not sufficient, mitigation is required. Mitigation should be calculated at a minimum of a 4:1 ratio starting with the first acre disturbed. Mitigation must produce lands capable of supporting sage-grouse as habitat before the proposed disturbance occurs, though birds do not need to be using	None

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			the mitigated area. The Applicant of the disturbance must demonstrate that the conditions have been met. Cumulative new permanent disturbance in the sage-grouse management area should not exceed 5 percent of the spatial extent of the nesting habitat in the sage-grouse management area. Allowances must be made to include the temporal effects of any temporary disturbance, if any such effects are expected.	
BLM	Rawlins Field Office RMP	Within 0.25 mile to 1.0 mile of an occupied greater sage-grouse lek	High-profile structures (e.g., buildings, storage tanks, overhead power lines, wind turbines, towers, windmills) will be authorized on a case-by-case basis.	None
BLM	Vernal Field Office RMP	Within 0.5 mile of known active leks	The best available technology will be used to reduce noise (e.g., installation of multi-cylinder pumps, hospital sound-reducing mufflers, and placement of exhaust systems).	None
BLM	Fillmore Field Office RMP	Within 2.0 miles of active sage-grouse strutting ground	Sagebrush manipulation will be prohibited in that zone and a seasonal off-highway vehicle restriction will be implemented.	None
Mexican Spotted Owl				
BLM	Vernal Field Office RMP	If owls are found, no actions will occur within 0.5 mile of identified nest site. If nest site is unknown, no activity will occur in the designated protected activity center.	For all permanent actions that may impact owls or suitable habitat, survey two consecutive years for owls according to accepted protocol prior to commencing activities. Avoid drilling and permanent structures within 0.5 mile of suitable habitat unless surveyed and not occupied.	BLM
BLM	Moab Field Office RMP	Mexican spotted owl protected activity centers, breeding habitat, or designated critical habitat	BLM will place restrictions on all authorized (permitted) activities that may adversely affect the Mexican spotted owl in identified protected	Exception: An exception may be granted by the Field Manager if authorization is obtained from FWS

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			activity centers, breeding habitat, or designated critical habitat to reduce the potential for adverse impacts on the species. Restrictions and procedures have been adapted from guidance published in the <i>Utah Field Office Guidelines for Raptor Protection from Human and Land-use Disturbances</i>, as well as coordination between the BLM and FWS. Measures include: • Surveys, according to FWS protocol, will be required prior to any disturbance-related activities that have been identified to have the potential to affect Mexican spotted owl, unless current species' occupancy and distribution information is complete and available. All surveys must be conducted by FWS certified individuals and approved by the BLM Authorized Officer. • Assessment of habitat suitability for both nesting and foraging using accepted habitat models in conjunction with field reviews. Apply the appropriate conservation measures below if Project activities occur within 0.5 mile of suitable owl habitat, dependent in part on if the action is: ○ Temporary: activities completed prior to the start of the following raptor breeding season, leaving no permanent structures, and resulting in no permanent habitat loss. ○ Permanent: activities that continue for more than one breeding season and/or cause a loss of owl habitat or displaces owls through disturbances (e.g., creation of a permanent structure including but not limited to well pads,	(through applicable provisions of the ESA). The Field Manager may also grant an exception if an environmental analysis indicates the nature or the conduct of the actions would not impair the primary constituent element determined necessary for the survival and recovery of the Mexican spotted owl and FWS concurs with this determination. Modification: The Field Manager may modify the boundaries of the stipulation area if an environmental analysis indicates and FWS (through applicable provisions of the ESA) determines a portion of the area is not being used as critical habitat. Waiver: A waiver may be granted if the Mexican spotted owl is de-listed and the Critical Habitat is determined by FWS as not necessary for the survival and recovery of the Mexican spotted owl.

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			roads, pipelines, electrical power line). For all temporary actions that may affect owls or suitable habitat: • If action occurs entirely outside of the owl breeding season, and leaves no permanent structure or permanent habitat disturbance, action can proceed without an occupancy survey. • If action will occur during a breeding season, conduct surveys for owls prior to commencing activity. If owls are found, activity should be delayed until outside of the breeding season. • Eliminate access routes created by the Project through such means as raking out scars, revegetation, gating access points, etc. For all permanent actions that may affect owls or suitable habitat: • Survey two consecutive years for owls according to established protocol prior to commencement of activity. • If owls are found, no actions will occur within 0.5 mile of an identified nest site. • If a nest site is unknown, no activity will occur in the designated protected activity center. • Avoid placing permanent structures within 0.5 mile of suitable habitat unless surveyed and not occupied. • Reduce noise emissions (e.g., use hospital-grade mufflers) to 45 decibels (A-weighted	

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			scale) at 0.5 mile from suitable habitat, including canyon rims. Placement of permanent noise-generating facilities should be determined by a noise analysis to ensure noise does not encroach upon a 0.5-mile buffer for suitable habitat, including canyon rims. • Limit disturbances to and in suitable owl habitat by staying on designated routes. • Limit new access routes created by the Project. BLM will, as a condition of approval on any project proposed within identified protected activity centers, designated critical habitat, or within spatial buffers for Mexican spotted owl nests (0.5 mile); ensure the Project Applicant is notified as to their responsibilities for rehabilitation of temporary access routes and other temporary surface disturbances created by the Project, according to individual BLM field office standards and procedures, or those determined in the Project-specific Section 7 Consultation. ▪ The BLM will require monitoring of activities in designated critical habitat, identified protected activity centers, or breeding habitats where it has been determined there is a potential for take. If any adverse impacts are observed to occur in a manner, or to an extent that was not considered in the Project-specific Section 7 Consultation, then consultation must be reinitiated.	

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			■ Monitoring results should document what, if any, impacts on individuals or habitat occur during Project construction/implementation. In addition, monitoring should document successes or failures of any impact minimization or mitigation measures. Monitoring results would be considered an opportunity for adaptive management, and as such, would be carried forward in the design and implementation of future projects. - For all survey and monitoring actions: • Reports must be provided to affected field offices within 15 days of completion of survey or monitoring efforts. • Report any detection of Mexican spotted owls during survey or monitoring to the Authorized Officer within 48 hours. ■ The BLM will, in areas of designated critical habitat, ensure that any physical or biological factors (i.e., the primary constituent elements), as identified in determining and designating such habitat, remains intact during implementation of any BLM-authorized activity. ■ For all BLM actions that may adversely affect the primary constituent elements in any suitable Mexican spotted owl habitat, BLM will implement measures as appropriate to minimize habitat loss or fragmentation, including rehabilitation of access routes created by the Project through such means as raking out scars, revegetation, gating access points, etc.	

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			▪ Where technically and economically feasible, use directional drilling from single drilling pads to reduce surface disturbance and minimize or eliminate needing to drill in canyon habitats suitable for Mexican spotted owl nesting. ▪ Prior to surface-disturbing activities in Mexican spotted owl protected activity centers, breeding habitats, or designated critical habitat, specific principles should be considered to control erosion. These principles include: • Conduct long-range transportation planning for large areas to ensure roads will serve future needs. This will result in less total surface disturbance. • Avoid surface disturbance in areas with high erosion hazards to the greatest extent possible. Avoid mid-slope locations, headwalls at the source of tributary drainages, inner valley gorges, and excessively wet slopes such as those near springs. In addition, avoid areas where large cuts and fills would be required. • Locate roads to minimize roadway drainage areas and to avoid modifying the natural drainage areas of small streams. ▪ Project developments should be designed and located to avoid direct or indirect loss or modification of Mexican spotted owl nesting and/or identified roosting habitats. ▪ Water production associated with BLM-authorized actions should be managed to ensure maintenance or enhancement of riparian habitats.	

TABLE E-16 CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS				
Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
BLM	Price Field Office RMP	Designated critical habitat	Any surface use or occupancy in designated critical habitat would be strictly controlled through close scrutiny of any surface use plan filed to protect habitat values and the use of the area by Mexican spotted owls. Modifications to the Surface Use Plan of Operations may be required for the protection of these resources. This limitation may apply to operation and maintenance of producing wells.	Exception: The Authorized Officer may grant an exception if an environmental analysis demonstrates that the action would not impair the function or utility of the site for nesting or other owl-sustaining activities. Modification: The Authorized Officer may modify the conditional surface use area in extent if an environmental analysis finds that a portion of the area is nonessential to site utility or function or if natural features provide adequate visual or auditory screening. Waiver: A waiver may be granted if the species is de-listed and the critical habitat is determined as not necessary for the survival and recovery of the species.
Mountain Plover				
BLM	Rawlins Field Office RMP	Within 0.5 mile of identified mountain plover-occupied habitat	Power lines will be buried or poles will include a perch-inhibitor in their design.	None
BLM	Rawlins Field Office RMP	Within 0.5 mile of identified mountain plover-occupied habitat	Road-killed animals will be promptly removed.	None
Southwestern Willow Flycatcher				
BLM	Moab Field Office RMP	Within a 0.25-mile buffer from suitable riparian habitats; within 0.5 mile of suitable southwestern willow flycatcher habitat	All ground-disturbing activities should be restricted within a 0.25-mile buffer from suitable riparian habitats and permanent surface disturbances should be avoided within 0.5 mile of suitable southwestern willow flycatcher habitat.	None
BLM	Moab Field Office RMP	Southwestern willow flycatcher habitat (riparian areas)	In areas that contain riparian habitat in the range for the southwestern willow flycatcher, actions will be avoided or restricted that may cause stress	Exception: An exception may be granted by the Field Manager if authorization is obtained from FWS

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			and disturbance during nesting and rearing of their young. Appropriate measures will depend on whether the action is temporary or permanent, and whether it occurs inside or outside the nesting season. A temporary action is completed prior to the following breeding season leaving no permanent structures and resulting in no permanent habitat loss. A permanent action continues for more than one breeding season and/or causes a loss of habitat or displaces flycatchers through disturbances (i.e., creation of a permanent structure). Current avoidance and minimization measures include the following: ▪ Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All surveys must be conducted by qualified individual(s) and be conducted according to protocol. ▪ Activities will require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures will be evaluated and, if necessary, Section 7 consultation reinitiated. ▪ Water production will be managed to ensure maintenance or enhancement of riparian habitat. ▪ Activities will maintain a 300 feet buffer from suitable riparian habitat year long. ▪ Activities within 0.25 mile of occupied breeding habitat will not occur during the breeding season of May 1 to August 15. ▪ Ensure that water extraction or disposal practices do not result in change of hydrologic regime that will result in loss or degradation of	(through applicable provisions of the ESA). The Field Manager may also grant an exception if an environmental analysis indicates that the nature of the conduct of the actions, as proposed or conditioned, will not impair the primary constituent element determined necessary for the survival and recovery of the southwestern willow flycatcher and FWS concurs with this determination. Modification: The Field Manager may modify the boundaries of the stipulation area if an environmental analysis indicates, and FWS (through applicable provisions of the ESA) determines that a portion of the area is not being used as southwestern willow flycatcher habitat. Waiver: May be granted if the southwestern willow flycatcher is delisted and if FWS determines it is not necessary for the survival and recovery of the southwestern willow flycatcher.

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			riparian habitat. ■ Revegetate with native species all areas of surface disturbance in riparian areas and/or adjacent land. ■ Additional measures to avoid or minimize effects on the species may be developed and implemented in consultation with the FWS between the lease sale stage and lease development stage to ensure continued compliance with the ESA.	
Western Yellow-billed Cuckoo				
BLM	Little Snake Field Office RMP	Current western yellow-billed cuckoo habitat	Construction of roads, pipelines, and power lines through riparian habitat should be placed near the edge of the current yellow-billed cuckoo habitat. Roads, new trails, and rights-of-way should be combined where possible, and stream crossings should be at right angles to yellow-billed cuckoo habitat to minimize impacts.	None
BLM	Little Snake Field Office RMP	Current western yellow-billed cuckoo habitat	To avoid direct impacts on or changes in riparian habitat, do not modify stream channel morphology.	None
Boreal Toad				
BLM	Rawlins Field Office RMP	In known western boreal toad habitat	Any action that would result in stream channel instability, erosion, and sedimentation will be avoided.	None
Big Game				
Mule Deer				
BLM	Vernal Field Office RMP	Deer crucial winter range	No more than 10 percent of such habitat will be subject to surface disturbance and remain un-reclaimed at any given time.	None

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Bighorn Sheep				
BLM	Salt Lake Field Office RMP	In bighorn sheep crucial winter and lambing areas	Once these ranges have been established by the reintroduced animals, appropriate dates and crucial habitats will be delineated.	Specific exceptions may be granted by BLM if the proposed activity will not seriously disturb the wildlife habitat values being protected.
Raptors				
Unoccupied Raptor Nests – Other Than Special Status Raptors				
BLM	Moab Field Office RMP; Price Field Office RMP	In spatial buffer of unoccupied nest	Ground-disturbing activities, occurring outside of the breeding season (seasonal buffer), but in the spatial buffer, would be allowed during a minimum 3-year nest monitoring period, as long as the activity would not cause the nest site to become unsuitable for future nesting, as determined by a wildlife biologist. Facilities and other permanent structures would be allowed, if they meet the above criteria.	None
Active Nests				
BLM	Grand Junction and White River Field Office RMPs	Standard designs for power line projects	Unless otherwise agreed upon in writing, power lines shall be constructed according to standards as outlined in <i>Suggested Practices for Raptor Protection on Power Lines, Raptor Research Foundation, Inc., 1981</i> . Industry officials shall assume the burden and expense of proving that pole designs not shown in publications are eagle safe. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modifications or additions to all power line structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the BLM.	None

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Bald Eagle Nocturnal Roost and/or Concentration Areas				
BLM	Little Snake Field Office RMP	Winter conservation areas	All new power line construction should comply with the Avian Power Line Interaction Committee's publication, <i>Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996</i> (Edison Electric Institute/Raptor Research Foundation 1996).	None
BLM	White River Field Office RMP	Bald eagle nest, roost, and perch substrate	This is a controlled surface use area for maintaining the long term suitability, utility and development opportunities for specialized habitat features involving nest, roost and perch substrate on federal lands. Prior to authorizing surface disturbance in this area, and pending conferral or consultation with the FWS as required by the ESA, the Area Manager may require the Applicant to submit a plan of development that would demonstrate that: ▪ involvement of cottonwood stands or cottonwood regeneration areas have been avoided to the extent practicable; ▪ special reclamation measures or design features are incorporated that would accelerate recovery and/or reestablishment of affected cottonwood communities; ▪ the predevelopment potential of affected floodplains to develop or support riverine cottonwood communities has not been diminished; and ▪ the current/future utility of such cottonwood substrate for bald eagle use would not be impaired.	Exception: The Area Manager may grant an exception to this stipulation if an environmental analysis indicates that the proposed or conditioned activities would not affect the long-term suitability or utility of habitat features or diminish opportunities for natural floodplain functions. Surface disturbance and occupation may indicate that the proposed or conditioned activities would not affect the long-term suitability or utility of habitat features or diminish opportunities for natural floodplain functions. Surface disturbance and occupation may also be authorized in the event that established impacts on habitat values would be compensated or offset to the satisfaction of the BLM in consultation with FWS and Colorado Parks and Wildlife. Modification: Integral with exception and stipulation Waiver: None

TABLE E-16
CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES
FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS

Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
BLM	Moab Field Office RMP	Nest sites and winter roost areas in habitat for bald eagles	In areas that contain habitat for the bald eagle, actions will be avoided or restricted that may cause stress and disturbance during nesting and rearing of their young. Appropriate measures will depend on whether the action is temporary or permanent, and whether it occurs inside or outside the bald eagle breeding or roosting season. A temporary action is completed prior to the following breeding or roosting season leaving no permanent structures and resulting in no permanent habitat loss. A permanent action continues for more than one breeding or roosting season and/or causes a loss of eagle habitat or displaces eagles through disturbances (i.e., creation of a permanent structure). Current avoidance and minimization measures include the following: ▪ 1. Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All surveys must be conducted by qualified individual(s), and be conducted according to protocol. ▪ Lease activities will require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures would be evaluated. ▪ Water production will be managed to ensure maintenance or enhancement of riparian habitat. ▪ Temporary activities within 1.0 mile of nest sites will not occur during the breeding season of January 1 to August 31, unless the area has been surveyed according to protocol and determined to be unoccupied.	Exception: An exception may be granted by the Field Manager if authorization is obtained from FWS (through applicable provisions of the ESA). The Field Manager may also grant an exception if an environmental analysis indicates that the nature of the conduct of the actions, as proposed or conditioned, will not impair the primary constituent element determined necessary for the survival and recovery of the bald eagles and FWS and Utah Division of Wildlife Resources (UDWR) concur with this determination. Modification: The Field Manager may modify the boundaries of the stipulation area if an environmental analysis indicates, and FWS and UDWR (through applicable provisions of the ESA) determine that a portion of the area is not being used as bald eagle nesting territories. Waiver: May be granted if bald eagles are de-listed and if FWS and UDWR determine it is not necessary to protect nesting territories according to the ESA and The Bald Eagle Protection Act or if there is no reasonable likelihood of site occupancy over a minimum 10-year period.

TABLE E-16
CONDITIONAL SURFACE USE RESTRICTIONS FOR BIOLOGICAL RESOURCES
FROM APPLICABLE BUREAU OF LAND MANAGEMENT, U.S. FOREST SERVICE, AND OTHER PLANS

Agency	Applicable Plan/Policy	Area to Which Restriction Applies	Restriction	Exception
			▪ Temporary activities within 0.5 mile of winter roost areas (e.g., cottonwood galleries) will not occur during the winter roost season of November 1 to March 31, unless the area has been surveyed according to protocol and determined to be unoccupied. ▪ No permanent infrastructure will be placed within 1.0 mile of nest sites. ▪ No permanent infrastructure will be placed within 0.5 miles of winter roost areas. ▪ Remove big game carrion to 100 feet from on lease roadways occurring in bald eagle foraging range. ▪ Avoid loss or disturbance to large cottonwood gallery riparian habitats. ▪ All areas of surface disturbance in riparian areas and/or adjacent uplands should be re-vegetated with native species.	

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APPENDIX F – COMPLIANCE WITH APPLICABLE SAGE-GROUSE POLICIES, PLANS, AND PROCEDURES AND APPLICANT-PROPOSED MITIGATION

F.1 Introduction

The Bureau of Land Management (BLM) and several cooperating agencies participating in the preparation of the Environmental Impact Statement (EIS) for the Energy Gateway South Transmission Project (Project) have recently updated or are in the process of revising policies and plans addressing management and conservation of greater sage-grouse (*Centrocercus urophasianus*) in the Project area. These revisions are largely in response to declining greater sage-grouse populations in the western United States, agency responsibilities for sage-grouse conservation, and the U.S. Fish and Wildlife Service's (FWS) *12 Month Findings for Petitions to List the Greater Sage-grouse as Threatened or Endangered*, published in March 2010, which found that listing the species under the Endangered Species Act was warranted but precluded by higher priority listing actions. Several of these policy and sage-grouse management plan revisions have been initiated or completed since the Applicant (PacifiCorp, doing business as Rocky Mountain Power) submitted an *Application for Transportation and Utility Systems and Facilities on Federal Lands* (Standard Form 299) on November 28, 2007, initiating the BLM and cooperating agencies' review of the Project.

The BLM and cooperating agencies have collaborated to prepare the EIS in accordance with current relevant law, regulation, policies, and plans; including those guiding agency decisions that may have an impact on sage-grouse and sage-grouse habitat. This appendix addresses actions and planning undertaken by the BLM, cooperating agencies, and the Applicant to prepare the EIS and potentially develop the Project in compliance with applicable law, regulation, policies, and plans related to sage-grouse.

The BLM and cooperating agencies collaborated to prepare a *Framework for Sage-grouse Impacts Analysis for the Energy Gateway South Transmission Project* (April 2013; Exhibit F1) as an early step to addressing potential impacts on sage-grouse during preparation of the EIS. The framework outlines the analysis and potential mitigation required for agencies whose decisions pertaining to the Project are evaluated in the EIS to adequately analyze the potential effects of the Project on sage-grouse and sage-grouse habitat and potentially select an action alternative that would be consistent with agency missions and goals pertaining to sage-grouse conservation. The framework also was developed to facilitate relevant cooperating agency decisions and evaluation of compliance with applicable plans and policies that are not subject to National Environmental Policy Act review and not addressed in the EIS.

F.2 Applicable Sage-grouse Policies and Plans

F.2.1 Federal

F.2.1.1 Bureau of Land Management Washington Office Instruction Memorandum 2012-043 Greater Sage-Grouse Interim Management Policies and Procedures

On December 22, 2011, BLM issued Washington Office (WO) Instruction Memorandum (IM) 2012-043, which provides interim conservation policies and procedures for greater sage-grouse that are to be applied

by BLM field offices to ongoing and proposed authorizations and activities. The purpose of the WO-IM 2012-043 is to promote sustainable greater sage-grouse populations and conserve greater sage-grouse habitat while BLM develops and decides how to best incorporate long-term conservation measures for greater sage-grouse into applicable land-use plans. The IM policies and procedures apply to BLM actions in preliminary priority habitat (PPH) and preliminary general habitat (PGH) for greater sage-grouse, which will be identified by the state wildlife agencies. (Note: The conservation policies and procedures described in the IM do not apply in areas where a state and/or local regulatory mechanism has been developed for the conservation of the greater sage-grouse in coordination and concurrence with the FWS, and the state sage-grouse plan has subsequently been adopted by the BLM through the issuance of a state-level BLM Instruction Memorandum). The WO-IM 2012-043 prescribes specific procedures for pending and future right-of-way applications in preliminary priority and preliminary general habitat. The Notice of Intent to prepare an EIS for the Project was published in the *Federal Register* on April 1, 2011, and therefore these procedures are applicable to the Project.

WO IM 2012-043 procedures for pending and future right-of-way applications in preliminary priority habitat include:

- Conduct pre-application meetings for all new right-of-way proposals consistent with the right-of-way regulations (43 Code of Federal Regulations [CFR] 2804.10) and consistent with current renewable energy right-of-way policy guidance (WO-IM-2011-061, issued February 7, 2011).
- For pending applications, assess the impact of the proposed right-of-way on greater sage-grouse and its habitat, and implement the following:
 - Ensure that reasonable alternatives for siting the right-of-way outside of the PPH or within a BLM-designated utility corridor are considered and analyzed in compliance with the National Environmental Policy Act
 - Identify technically feasible best management practices, conditions, etc. (e.g., siting, burying powerlines) that may be implemented in order to eliminate or minimize impacts
- For right-of-ways where the total project disturbance from the right-of-way and any connected action is less than 1 linear mile, or 2 acres of disturbance, develop mitigation measures related to construction, maintenance, operation, and reclamation activities that, as determined in cooperation with the respective state wildlife agency, would cumulatively maintain or enhance greater sage-grouse habitat.
- For right-of-way applications where the total project disturbance from the right-of-way and any connected action is greater than 1 linear mile or 2 acres of disturbance, it is BLM policy that where a field office determines that it is appropriate to authorize a right-of-way, the following process must be followed:
 - The BLM will document the reasons for its determination and require the right-of-way holder to implement measures to minimize impacts on sage-grouse habitat.
 - In addition to considering opportunities for onsite mitigation, the BLM will, to the extent possible, cooperate with project proponents to develop and consider implementing appropriate offsite mitigation that the BLM, coordinating with the respective state wildlife agency, determines would avoid or minimize habitat and population-level effects (refer to WO-IM-2008-204, Off-site Mitigation). When developing such mitigation, the BLM should consider compensating for the short-term and long-term direct and indirect loss of greater sage-grouse and its habitat.
 - Unless the BLM determines, in coordination with the respective state wildlife agency, that the proposed right-of-way and mitigation measures would cumulatively maintain or enhance greater sage-grouse habitat, the proposed right-of-way decision must be forwarded to the appropriate BLM State Director, State Wildlife Agency Director, and FWS representative for

their review. If this group is unable to agree on the appropriate mitigation for the proposed right-of-way, then the proposed decision must be forwarded to the Greater Sage-Grouse National Policy Team with the addition of the State Wildlife Agency Director, when appropriate, for its review. If the National Policy Team and the State Wildlife Agency Director are unable to agree on the appropriate mitigation for the proposed right-of-way, the National Policy Team will coordinate with and brief the BLM Director for a final decision in absence of consensus.

The three states crossed by the Project (Wyoming, Colorado, and Utah) all have statewide sage-grouse management plans and are participating with BLM and U.S. Forest Service (USFS) in the ongoing amendments of resource management plans (RMPs) and land and resource management plans (LRMPs), respectively, and interim management of sage-grouse differently as follows:

- Wyoming has established a state regulatory mechanism for the conservation of the sage-grouse and the BLM has adopted this state strategy through the issuance of BLM IM WY 2012-019; therefore, PPH and PGH will not be designated in Wyoming. The Wyoming Core Areas have been adopted by the BLM.
- Colorado has developed PPH and PGH that focus conservation efforts on the most important habitat for the species and provides a biological basis for land use recommendations under BLM WO IM 2012-043 and is participating with the BLM in the ongoing amendments of RMPs in Colorado.
- Utah has developed a state regulatory mechanism for the conservation of sage-grouse that could be adopted by the FWS and BLM in place of the conservation measures identified in the IM and has not designated PPH and PGH. However, BLM has not adopted the state regulatory mechanism at this time. For the purposes of identifying PPH and PGH, BLM considers the Utah Division of Wildlife Resources (UDWR) occupied sage-grouse habitat layer to be synonymous with PPH in the Utah; no PGH has been identified.

F.2.1.2 U.S. Forest Service Interim Recommendations for Greater Sage-grouse and Greater Sage-grouse Habitat

On October 12, 2012 the USFS issued Interim Recommendations for Greater Sage-Grouse and Greater Sage-Grouse Habitat. Similar to BLM WO IM 2012-043, the USFS Interim Recommendations provide conservation policies and procedures for greater sage-grouse that are to be applied on National Forest system land until USFS LRMPs are incorporated to include sage-grouse conservation measures. Additionally, USFS seeks to promote consistency with BLM management of sage-grouse on BLM-administered lands under BLM WO IM 2012-043.

The USFS Interim Recommendations for Greater Sage-Grouse and Greater Sage-Grouse Habitat recommendations for nonrecreational special use proposals including power lines direct USFS to:

- Within 3 kilometers of sage-grouse habitat, avoid authorizing placement of overhead power lines or other tall structures that provide perch sites for raptors.
- Determine, in coordination with the respective state wildlife agency, whether a proposal that may affect sage-grouse or sage-grouse habitats would likely have more than minor adverse effects on sage-grouse or sage-grouse habitat.
- If the proposed use likely would have more than minor adverse effects on sage-grouse habitat:
 - Consider feasible alternatives for siting the use outside of sage-grouse habitat; and

- Identify technically feasible best management practices in terms of siting placement of overhead power lines or other tall structures (e.g., burying power lines) that may be implemented, to avoid or minimize impacts on sage-grouse or sage-grouse habitats.
- In consultation with the state wildlife agency, develop mitigation measures for construction, maintenance, operation, and reclamation of the proposed use that minimize impacts on sage-grouse habitat.

F.2.1.3 BLM Resource Management Plans and USFS Forest Plans

Many BLM RMPs and USFS LRMPs contain land-use restrictions to promote sage-grouse conservation (e.g., limitations on development activities near sage-grouse leks). Restrictions identified in applicable plans are detailed in EIS Appendix E, Table E-11 and have been considered in the analysis presented in Chapter 3. BLM and USFS are currently preparing amendments and EISs for applicable RMPs and LRMPs in Wyoming, Colorado, and Utah to include additional sage-grouse conservation measures. The BLM and USFS amendments of applicable land-use plans are anticipated to be complete prior to the Record of Decision for the Project. If an action alternative is selected, the Project would be developed in compliance with the conservation measures in applicable BLM RMPs and USFS LRMPs.

F.2.2 State

F.2.2.1 Wyoming

The Governor of Wyoming issued Executive Order 2011-5 in June 2011. Executive Order 2011-5 replaced previous executive orders pertaining to sage-grouse in Wyoming and established a state regulatory mechanism to protect sage-grouse and sage-grouse habitat. The Executive Order established Core Population Areas and focuses conservation efforts in these areas including limits on the density of surface disturbance and restrictions on surface occupancy and seasonal use (EIS Appendix E, Table E-11). Additionally, the Executive Order established new transmission line corridors through the Core Population Areas and implemented restrictions on development of new transmission lines within core areas outside of the established corridors.

In addition to Executive Order 2011-5, the Wyoming Game and Fish Commission adopted the Wyoming Greater Sage-grouse Conservation Plan in 2003. The plan was developed to maintain and improve sage-grouse habitats in Wyoming, provide for coordinated management across jurisdictional or ownership boundaries, and develop the statewide support necessary to assure the survival of Wyoming's sage-grouse populations. The plan is intended to be used as guidance regarding sage-grouse management by state and federal agencies in Wyoming and the Wyoming Game and Fish Commission has sought agreements with federal agencies to implement the plan.

F.2.2.2 Colorado

The Colorado Greater Sage-grouse Steering Committee published the Colorado Greater Sage-grouse Conservation Plan in 2008. The purpose of the plan is to facilitate the conservation of sage-grouse and their habitats in Colorado by supporting goals that, if achieved, would facilitate the recovery of the species and result in its removal from the state's species of concern list. Guidelines for sage-grouse protection from populations and habitat disturbance were developed as a part of the plan (EIS Appendix E, Table E-11). Colorado Parks and Wildlife works collaboratively with federal, state, and local agencies as well as local working groups to implement the recommendations included in the plan.

The Colorado Department of Natural Resources is working collaboratively with BLM during the ongoing amendment of BLM RMPs to include sage-grouse conservation measures and is providing information to

FWS for consideration in its development of a listing decision for the species. This work includes the identification of sage-grouse PPH and PGH in the state as well as preparation of “The Colorado Package,” a compilation of accomplishments and ongoing actions to promote sage-grouse conservation based on the strategies identified in the 2008 Colorado Greater Sage-grouse Conservation Plan.

F.2.2.3 Utah

The Governor of Utah approved the Conservation Plan for Greater Sage-grouse in Utah in April 2013. The plan is designed to eliminate the threats facing sage-grouse while balancing the economic and social needs of the residents of Utah by establishing incentive-based conservation programs for private, local government, and School and Institutional Trust Lands Administration lands and regulatory programs on other state- and federally managed lands. To achieve this goal, the plan establishes sage-grouse management areas and implements management protocols in these areas. Management provisions in sage-grouse management areas include seasonal and spatial restrictions on development activities, limits on extent of new cumulative permanent disturbance, and special provisions for electric transmission lines.

Additionally, the UDWR published the Utah Greater Sage-grouse Management Plan in 2009. The plan identifies threats and issues affecting sage-grouse management in Utah as well as goals, objectives, and strategies intended to guide UDWR, local working groups, and land managers efforts to protect, maintain, and improve sage-grouse populations and habitats and balance their management with other resource uses.

F.2.3 Local

F.2.3.1 Local Area Working Groups

The Project could cross sage-grouse habitats in the boundaries of eight sage-grouse local working groups; three in Utah (Uinta Basin, Strawberry Valley, and Castle Country), three in Colorado (Northwest Colorado, Piceance/Parachute/Roan Creek, and Pinon Mesa), and 2 in Wyoming (Bates Hole/Shirley Basin and South-central Wyoming). Each local working group has prepared a conservation plan to assess the status of local populations, to provide guidance and recommendations to meet objectives for maintaining sage-grouse populations and improving habitat, and to promote incorporation of local knowledge and local participation in larger efforts to promote conservation of sage-grouse.

F.3 Coordination and Actions Taken to Comply With Applicable Plans and Policies

Sage-grouse and sage-grouse habitats are widespread in landscapes crossed by the alternative routes in Wyoming, Colorado, and Utah. BLM and the cooperating agencies acknowledged that alternative routes that avoid sage-grouse and sage-grouse habitat would not be feasible early during the preparation of the EIS. The agencies collaborated with the Applicant to identify feasible strategies to avoid, minimize, and compensate for the potential effects of the Project on sage-grouse pursuant to the plans and policies described in Section F.2.

F.3.1 Project Siting

The BLM worked with the cooperating agencies and the Applicant to avoid and minimize potential effects on sage-grouse by identifying and eliminating or modifying alternative routes that would have substantially greater effects on sage-grouse or sage-grouse habitat compared to other alternative routes considered.

F.3.3.1 Routes Eliminated from Further Consideration

Transmission line alternative routes and segments included in the Applicant's Application for Transportation and Utility Systems and Facilities on Federal Lands were systematically screened and analyzed using the methods described in EIS Sections 2.5.1.1 and 2.5.1.3. Alternative routes that would have substantially higher impacts on sage-grouse and sage-grouse habitat compared to other alternative routes studied were eliminated from further consideration in the EIS. Alternative routes and segments that were eliminated from further consideration at least in part due to their impacts on sage-grouse and sage-grouse habitats include (refer to *Energy Gateway South Transmission Project Siting Study Report*, BLM 2012; EIS Section 2.5.1.1; and EIS Maps 2-3a and 2-3b):

Wyoming

- Links W17 and W18 were eliminated from consideration because they cross the Hannah sage-grouse core area outside of the utility corridor identified in the Wyoming Governor's Executive Order 2011-5 and are not parallel to an existing transmission line. Therefore, these links do not comply with the Executive Order regarding greater sage-grouse core area protection.
- Links W19 and W20 were eliminated from consideration because they cross the Hannah and South Rawlins sage-grouse core areas outside of the utility corridor identified in the Wyoming Governor's Executive Order 2011-5 and do not parallel to an existing transmission line. Therefore, these links do not comply with the Executive Order regarding greater sage-grouse core area protection.
- Links W453, W454, W490, W491, W492, W493, and W520 were eliminated from consideration because any route using these links would be required to cross the Salt Wells sage-grouse core area outside of the utility corridor identified in the Wyoming Governor's Executive Order 2011-5 and would not be parallel to an existing transmission line. Therefore, alternative routes using these links do not comply with the Executive Order regarding greater sage-grouse core area protection. Additionally, alternative routes using these links may have substantial impacts on sage-grouse in Utah (refer to description of Links U20, U30, and U90).

Colorado

- Links C50, C45, C51, and C80 were eliminated from consideration because they cross important habitats that support some of the highest densities of breeding sage-grouse in the Northwest Colorado sage-grouse population, which is the largest sage-grouse population in Colorado.

Utah

- Links U20, U30, and U90 were eliminated from consideration because they cross important habitats occupied by the Diamond Mountain sage-grouse population, which is one of the largest and most robust sage-grouse populations of sage-grouse in Utah. Additionally, alternative routes using these links may have substantial impacts on sage-grouse in Wyoming (refer to description of Links W453, W454, W490, W491, W492, W493, and W520).
- Link U322 was eliminated from consideration because it crosses important habitats occupied by the Halfway Hollow sage-grouse population that have not been affected by previous transmission line development. Additionally, alternative routes using this link may have substantial impacts on other important sage-grouse habitats in Wyoming and Utah (refer to description of Links W453, W454, W490, W491, W492, W493, W520, U20, U30, and U90).
- Links U422 and U423 were eliminated from consideration because they are not located adjacent to an existing high-voltage transmission line and therefore would have greater impacts on sage-

grouse compared to Links U425, U426, and U427, which were retained for analysis, where they cross important habitats occupied by the Strawberry/Fruitland sage-grouse population.

F.3.3.2 Revision to Alignments and Incorporation of Local Route Variations

The BLM, cooperating agencies, and the Applicant worked collaboratively to refine the alternative routes analyzed in the EIS, as practicable, to avoid or minimize effects on sage-grouse and important sage-grouse habitats. These refinements included local adjustments to the alternative routes to locate them outside of designated sage-grouse habitat or in habitats of lower value to sage-grouse and development of local route variations that would avoid important sage-grouse habitats. Segments that were refined and local route variations that were developed at least in part to reduce potential effects on sage-grouse and sage-grouse habitats include:

Wyoming

- The alignment of Link W21 was refined to reduce impacts on sage-grouse by locating the segment closer to other planned infrastructure and closer to the center of the utility corridor identified in Wyoming Governor's Executive Order 2011-5 in the Hanna sage-grouse core area.

Colorado

- The alignment of Links C61, C71, C72, and C91 were refined to reduce impacts on sage-grouse, to the extent practicable, by locating the segments farther away from known sage-grouse leks and outside of sage-grouse priority habitat used by the Northwest Colorado sage-grouse population.

Utah

- The alignment of Links U401 and U404 were refined to avoid important habitats occupied by the Anthro Mountain sage-grouse population.
- Links U409, U411, U520, U514, U516, U560, U515, U540, and U513 were developed to provide local route variations in Utah that would avoid sage-grouse leks and other important habitats occupied by the Emma Park sage-grouse population, which is one of most robust sage-grouse populations in Utah (refer to EIS Section 3.2.8.5).

F.3.2 Development of Additional Onsite Mitigation

The BLM, cooperating agencies, and the Applicant are working collaboratively to develop onsite mitigation measures that could be used to reduce impacts on sage-grouse and sage-grouse habitat in addition to the mitigation measures in applicable BLM, USFS, and state agency plans. Development of additional onsite mitigation measures to reduce potential effects on sage-grouse is ongoing and the final measures will be outlined in the Applicant's voluntary sage-grouse conservation and mitigation plan for the selected alternative route. Mitigation measures that have been agreed-on include:

- Modification of the proposed tower design to use H-frame tubular steel structures (Selective Mitigation Measure 6 [EIS Table 2-13]) and the installation of perch deterrents on these structures (Selective Mitigation Measure 14) within 4 miles of sage-grouse leks in designated sage-grouse core areas and priority habitats to reduce potential sage-grouse predation by raptors (refer to EIS Section 3.2.8.4).

Other mitigation measures that are being considered include:

- Reduced speed limits during construction and maintenance activities to reduce risk of sage-grouse collision with moving vehicles and reduce disturbance to sage-grouse resulting from vehicle noise;
- Additional restrictions on use of herbicides in areas where sage-grouse are known to congregate;
- Special reclamation standards focused on restoring functionality and quality of sage-grouse habitat beyond the minimum standards required by agency policy;
- Expanded seasonal and spatial restrictions in important sage-grouse habitats beyond the minimum restrictions required by applicable agency policies and plans; and
- Reducing the separation between the Project and other linear infrastructure (including other transmission lines) for short distances in important sage-grouse habitats where high levels of impact on sage-grouse are anticipated.

F.3.3 Development of Offsite Mitigation

Despite removing and modifying alternative routes and segments that would have comparatively higher impacts on sage-grouse and implementing additional onsite mitigation, BLM and the cooperating agencies anticipate that implementation of any of the alternative routes analyzed in the EIS would result in high residual impacts on sage-grouse and sage-grouse habitat (refer to EIS Section 3.2.8.5). The residual impacts would not be consistent with the objectives for sage-grouse and sage-grouse habitat management identified in applicable agency plans and policies (Section F.2). In accordance with BLM WO IM 2013-142 and other cooperating agency policies pertaining to offsite mitigation, BLM, the cooperating agencies, and the Applicant are working collaboratively to develop appropriate offsite mitigation that could be implemented to facilitate reasonable development of the Project consistent with applicable agency plans and policies pertaining to sage-grouse. To facilitate this collaboration, the Applicant has convened a group of sage-grouse biologists from the BLM and cooperating agencies (the Habitat Equivalency Analysis [HEA] Technical Working Group) to provide input and guidance for developing the Applicant's Sage-grouse Mitigation Plan, including the HEA (refer to EIS Section 6.2.2.1). The methods used in development of the Applicant's Sage-grouse Mitigation Plan, including the HEA and the types of offsite mitigation being considered are described in Exhibit B (Energy Gateway South Transmission Project Greater Sage-grouse Habitat Equivalency Analysis Plan).

F.4 Applicant Provided Commitments for Mitigation

The following statement was prepared by the Applicant to outline the company's intention to prepare a voluntary sage-grouse conservation and mitigation plan for the selected alternative route:

The Draft EIS analysis describes potential Project-related impacts on sage-grouse and their habitat. These impacts have been minimized or avoided to the extent feasible by the BLM and cooperating agencies using avoidance and minimization measures (e.g., seasonal restrictions) from applicable BLM, USFS, and other applicable land-use and conservation plans. After application of these avoidance and mitigation measures, the BLM analysis indicates that impacts on sage-grouse and their habitat are likely to occur as a result of implementation of the Project. To meet requirements of BLM IM 2012-043, October, 2012 USFS Manual updates, and other applicable agency policies, Rocky Mountain Power will take voluntary actions to avoid, minimize, and compensate for the Project's effects on sage-grouse and their habitat.

The agencies have developed a framework for Sage-grouse Impacts Analysis for the Energy Gateway South Transmission Project. The framework is used by the Applicant

and the agencies to identify and analyze Project-related impacts and develop adequate mitigation. The framework identifies the use of a Habitat Equivalency Analysis (HEA), conducted by the project Applicant, as a replicable method for determining mitigation that is scaled to Project-related permanent and interim losses of sage-grouse habitat services.

In coordination with the agencies, Rocky Mountain Power will develop a voluntary sage-grouse conservation and mitigation plan for the preferred alternative route. The final plan will document Rocky Mountain Power's offer of scaled mitigation and other voluntary Applicant-committed mitigation measures for sage-grouse. The mitigation plan will offer measures to avoid, minimize, or compensate for all Project effects characterized by the framework and identified in the EIS that could not be mitigated or avoided using measures in BLM or other agency plans, including losses of habitat services quantified using the HEA.

F.4.1 Energy Gateway South Transmission Project Greater Sage-grouse Habitat Equivalency Analysis Plan

The *Energy Gateway South Transmission Project Greater Sage-grouse Habitat Equivalency Analysis Plan*, developed by the Applicant in coordination with the HEA Technical Working Group (refer to EIS Section 6.2.2.1) is included as Exhibit F2.

**Exhibit F1 –
Framework for
Sage-grouse Impacts Analysis**

Framework for Sage-grouse Impacts Analysis for the Energy Gateway South Transmission Project December 3, 2013

(1) Evaluation of Direct and Indirect Impacts - This portion of the overall Greater Sage-Grouse (hereafter sage-grouse) Impacts Assessment Framework addresses Project-related habitat impacts that bear directly on listing factors considered by the U.S. Fish and Wildlife Service (FWS) when evaluating the need to provide full listing protection under the Endangered Species Act (ESA).

A starting point for this analysis is a thorough review of the threats assessment/five factor analysis that FWS conducted as part of the March 23, 2010 (75 FR 13910), listing of the sage-grouse as a Candidate under ESA. An evaluation of all potential threats to sage-grouse and sage-grouse habitat from the transmission line should be conducted incorporating the latest available scientific information—most of which is referenced in the *Federal Register* notice itself.

Of particular importance is the synthesis evaluation of all potential threats of the Project that operate cumulatively to impact sage-grouse populations and habitat in a way that is not adequately evaluated by examining threats independently. The direct, indirect and cumulative impacts analysis for the Project should consider the *Federal Register* notice cumulative threats assessment summary as an example of how to fully analyze impacts associated with the proposed project. Reference to additional scientific information published since the issuance of the *Federal Register* notice is available on the FWS website and should be incorporated into the analysis: Best available scientific information should be used in the direct, indirect and cumulative impacts analysis.

A project environmental affects analysis of sage-grouse populations that attend leks within 18 kilometers of the Project is a critical component of an indirect impacts analysis for the species. Sage-grouse that attend leks up to 18 kilometers from the Project may be indirectly affected by the loss of habitat functionality during other seasons of the year (Connelly et.al. 2000). The construction of a transmission project or other linear facility may pose additional hindrance of seasonal migration patterns or avoidance of important seasonal habitats once used extensively by local sage-grouse populations. Qualitative and quantitative measures of habitat change must be considered in describing the potential impacts of the Project. In the context of managing a species that requires such a large landscape of habitats to meet their life-cycle needs, and the nature of the proposed disturbance, it is reasonable to make some assumptive predictions about the relative impacts within 18 kilometers.

(2) Addressing Direct Loss of Birds - This piece of the overall Greater Sage-Grouse Impacts Assessment Framework is an important contribution to the range wide jeopardy analysis conducted as part of the informal conferencing process for this Candidate species. Additionally, addressing impacts on populations provides key information needed for completing any potential future formal Section 7 consultation that would be required if the sage-grouse is ultimately listed under ESA during project development, thereby significantly streamlining this process.

FWS is actively working on this issue as it relates to range wide sage-grouse conservation. There are two ways that the Applicant is expected to help resolve this concern:

- (a) Work closely with FWS and state agency biologists to develop an approach to address loss of birds from Project-related impacts and their replacement. This will include development of a monitoring plan utilizing best and most current scientific methods for estimating loss of birds during both construction and operational periods after the Project is constructed. Monitoring would be conducted using a Bakke design (preconstruction, postconstruction, and control site monitoring) to compare changes in local populations and habitat use that could occur in the analysis area.
- (b) Contribute financially to research projects that have been designed specifically to address this issue.

(3) Mitigation - An impacts analysis that has been conducted in coordination with agency biologists—leading to an adequate understanding of impacts on sage-grouse populations and habitat—is necessary to identify mitigation needs and to develop mitigation plans that focus on the amount and locations of impacts and commensurate mitigation measures and actions. Discussion and evaluation of mitigation should be relevant to local identified impacts and with the understanding that mitigation ratios will remain the same across state lines. That is, a bird in Wyoming is equivalent to one in Colorado or Utah; an acre of nesting habitat in Colorado is worth as much in Wyoming and Utah; etc. Mitigation actions should also focus on localized replacement of ecological values for GSG impacted by the Project with replacement, recovery, or compensation of habitat values planned to be located as closely as possible to where the impacts occurred. However, biological factors may provide a valid basis for adjusting the minimal mitigation ratio beyond one-to-one replacement of values. Three such factors include: (a) the best available scientific information regarding the relative value of sage-grouse populations contributing to long-term species viability across the species' range points to the relative importance of central and southwestern Idaho, central and northwestern Nevada, eastern Oregon, and the state of Wyoming; (b) regarding individual birds, hens have a much higher biological value, in terms of contribution to populations, than males; and (c) localized habitats of high ecological value including (but not limited to) those serving key functions in demographic, genetic, or seasonal connectivity, important wintering areas, or leks.

There will be two primary components of mitigation, a Project-wide mitigation plan and the Habitat Equivalency Analysis (HEA) described in this section. The mitigation plan will include the HEA as articulated below, as well as any other impacts as identified in the EIS (i.e., indirect impacts) and associated mitigation not included in the HEA.

- (a) An overarching Project-wide sage-grouse mitigation plan will be developed that includes a description of all Project-related impacts and mitigation measures that will be used to offset/compensate for them.
- (b) The HEA provides a standardized basis to determine a one-to-one ratio for habitat services lost/ habitat services mitigated. For this Project, functionality of habitat to support sage grouse is the habitat service of interest. Habitat services lost can be quantified and where possible replacement habitat services of equal kind and value would be provided as mitigation. However, replacement of in-kind habitat services may not be possible in all locations, so habitat services ratio of services lost to services replaced may be greater than 1:1 in some areas

HEA is a method of quantifying the permanent or interim loss of habitat services from Project-related impacts. HEA provides a scientific-based, peer-reviewed method of scaling mitigation requirements, and has been used by federal regulatory agencies including the FWS and National Oceanic and Atmospheric Administration. The HEA is not meant to be an impacts analysis in and of itself; rather, it is a way to objectively determine quantity of Project-related habitat impacts and provides the quantity and type of mitigation necessary to offset loss of habitat services as a form of output.

The HEA process for Gateway South is an Applicant-lead effort that requires close collaboration with state agencies in states sustaining most of the impacts on populations and habitat (Wyoming, Colorado, and Utah) as well as FWS and BLM biologists and local working groups to ensure adequacy of analysis and a corresponding final product. Building models associated with the HEA process must be done in close coordination with agency biologists and local working groups in order to address concerns, questions, assumptions, and issues as they arise.

Agency biologists recognize the need for the incorporation of data and information in the HEA models that the Applicant may not currently have. Agency biologists will work with the Applicant to obtain such information to the extent they can (e.g., habitat maps; adequate vegetation data) again, reiterating the need for an interactive approach between the Applicant and agency biologists in order to ensure adequate completion of the HEA.

The initial starting point for evaluating direct and indirect impacts on sage-grouse habitat will be 18 kilometers either side of the proposed transmission line, addressing impacts on roughly 98 percent of nesting hens according the best available scientific information. Any deviation from this starting point must be supported by scientific literature and collaboratively determined to be appropriate if habitats do not extend to those distances: agency biologists can direct the Applicant to recently published literature on this topic which the Applicant is encouraged to use.

Calculating Density of Disturbance within Key Habitat (Applied in Wyoming only)

Once the analysis is complete and an alternative has been selected, an additional site-specific evaluation of density of disturbance within Key Habitats/Core Areas may be conducted. The purpose of this evaluation is to evaluate opportunities to (1) minimize density of disturbance within Key Habitats/Core Areas that are outside the designated disturbance corridor identified in the Wyoming Governor's Executive Order 2011-5 and (2) restore and/or enhance important sage-grouse habitat as a part of Project-related mitigation. These site-specific habitat evaluations also will enable BLM to: (a) demonstrate compliance with the *Greater Sage-Grouse Habitat Management Policy on Wyoming BLM Administered Public Lands including Federal Mineral Estate* (IM WY-2010-012); and (b) demonstrate consistency with the *Greater Sage-Grouse Core Area Protection*, Wyoming Governor's Executive Order 2011-5. In Colorado and Utah, if density disturbance calculations are completed, they will be closely coordinated with the appropriate state and federal agencies to ensure that each state's Key Habitat areas are appropriately identified and considered in the Density disturbance calculation (DDC).

The overall goal of a Sage-Grouse Key Habitat/Core Area Strategy is to limit the density and duration of disturbances and restrict activities within Key Habitats/Core Areas sufficient to ensure the long-term conservation and management of sage-grouse within each state. To this end, the DDC is a tool designed to measure habitat loss within the Key Habitat/Core Area. In particular, in Wyoming, it is used to determine—in terms of management actions—how the Project-related disturbance can be limited to no more than 5 percent loss of habitat and result in no more than an average of one disturbance per 640 acres.

Step 1: Determination of leks that will be used in the site-specific evaluation:

Place a four-mile boundary around the outer Project boundary (as defined by the proposed area of disturbance related to the Project, i.e., right-of-way width, or similar). All occupied and undetermined sage-grouse leks located within four miles of the outer boundary of the Project, and within Key Habitat/Core Areas, will be considered in the DDC.

Step 2: Determine the DDC area size and configuration:

A four-mile boundary placed around the perimeter of each lek identified in Step 1 and the area within the boundary of the leks, plus the four-mile Project boundary, creates the DDC area for the Project.

Step 3: Density of disturbance habitat evaluation:

Disturbance will be evaluated for the DDC area as a whole, as well as for individual leks within the DDC area. Any portion of the DDC that falls outside Key Habitat/Core Area will be removed from this portion of the evaluation for Wyoming to maintain consistency with the provisions in Wyoming Executive Order 2011-5.

Disturbance Calculation: Total acres of “disturbance” within the DDC area will be determined through an evaluation of:

- a. Existing and proposed disturbance—sage-grouse habitat that is disturbed by existing anthropogenic features or activities (e.g., transmission lines, distribution lines, wind

development, oil/gas wells/facilities, active mine areas, geothermal, communication towers, pipelines, paved and improved roads, and others) and wildfire, including the full right-of-way width of the Proposed Action;

- b. Approved permits (i.e., any state or federal permits providing approval for on the ground actions) for projects not yet implemented or constructed.

Habitat Disturbance Evaluation: In Wyoming, for projects that will result in disturbance of more than 5 percent of the DDC area, it may be advantageous for the Applicant to map the full extent of sage-grouse habitat within the DDC area in order to reduce this percentage. If this is done, it will be conducted to identify:

- a. “Suitable Habitat” and “Marginal Habitat” using BLM’s Habitat Assessment Framework and unsuitable habitats within the DDC area
- b. Sage-grouse evidence of use of suitable habitats (seasonal use, densities based on best available information)
- c. Priority restoration areas (which could reduce the existing disturbances to below the 5 percent threshold), for example:
 - i) Areas where plug and abandon activities on retired oil and gas wells will eliminate disturbance
 - ii) Areas where past reclamation has not produced suitable habitat
- d. Areas of invasive species
- e. Lands where other conservation assurances are in place (e.g., candidate conservation agreement with assurances, easements, habitat contract, etc.)

Step 4: Determination of existing and allowable suitable habitat disturbance:

Acres of disturbance within suitable habitat divided by the total suitable habitat within the DDC area, multiplied by 100, represents the percent of disturbed suitable habitat within the DDC area. In Wyoming, subtracting the percentage of existing disturbed suitable habitat from 5 percent equals new allowable suitable habitat disturbance until plant regeneration or reclamation reduces acres of disturbed habitat within the DDC area.

**Exhibit F2 –
Greater Sage-grouse
Habitat Equivalency Analysis Plan**



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Energy Gateway South Transmission Project Greater Sage-grouse Habitat Equivalency Analysis Plan

Prepared by

Rocky Mountain Power – PacifiCorp

May 2013

**Energy Gateway South Transmission Project
Greater Sage-grouse Habitat Equivalency Analysis Plan**

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May 2, 2013

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INTRODUCTION

The Gateway South Transmission Line Project (Gateway South or Project) is part of PacifiCorp's transmission expansion program, called Energy Gateway, which is intended to connect new and existing energy generation resources to customers throughout PacifiCorp's service territory. Energy Gateway is composed of several large-scale projects that will support increasing electric energy use and improve system reliability.

The Project is designed to provide 1,500 megawatts (MW) of new capacity needed to meet the current and forecasted needs of PacifiCorp's customers. These forecasts are based on PacifiCorp's Integrated Resource Plan (IRP) as required to fulfill the regulatory requirements and guidelines established by the public utility commissions of the states served by PacifiCorp. The IRP addresses the obligations of each company, pursuant to the Open Access Transmission Tariff, to plan for and to expand its transmission system in a non-discriminatory manner based on the needs of its native load and network customers.

Gateway South is independent of, and would be proposed regardless of, any particular new generation project. The transmission grid can be thought of in terms of hubs, spokes, and a backbone connecting the hubs. Each substation is a hub that receives or sends electricity along the spokes. For this system to work, a backbone of high-capacity transmission lines (including Gateway South) is needed to connect the hubs and transport the electricity from the source to the customer.

Gateway South will:

- Provide long-term transmission capacity to move resources to growing load centers;
- Connect Gateway West and Gateway Central, which will provide operational flexibility for the bulk electric network, increase reliability of the network, and support path ratings for each segment;
- Improve capacity and reliability of other interconnected transmission lines associated with Energy Gateway;
- Reduce transmission limitations on the existing system; and
- Provide incremental transmission capacity planned at approximately 1,500 MW.

As proposed, the Project would be comprised of an extra high-voltage alternating current (AC) transmission line that would run between existing, planned, and proposed substations. The proposed single-circuit 500-kilovolt (kV) transmission line would be approximately 400 miles in length; the line would begin at the planned Aeolus Substation near Medicine Bow, Wyoming, connect to two separate proposed series compensation substations, and terminate at the existing Clover Substation near Mona, Utah. Two proposed series compensation substations are planned at approximately the one-third and two-third points along the line between the Aeolus and Clover Substations. Modifications at the existing Mona Substation are required to re-terminate existing lines to accommodate the nearby 500-kV termination at Clover Substation.

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Gateway South will cross federal, state, and private lands along its route from Wyoming to Utah. The federal lands are primarily administered by the Bureau of Land Management (BLM). As such, PacifiCorp filed an application with BLM for a right-of-way (ROW) grant across public lands. The BLM, in compliance with the National Environmental Policy Act of 1969 (NEPA), is preparing an environmental impact statement (EIS) for Gateway South to inform its decision making on PacifiCorp's ROW grant application.

In December 2011, BLM released an instruction memorandum to help guide conservation actions aimed at conserving greater sage-grouse (*Centrocercus urophasianus*) (sage-grouse) and its sagebrush habitat. Instruction Memorandum No. 2012-043 (IM 2012-43) helps to balance conservation actions benefiting sage-grouse while maintaining a robust economy in the West by outlining processes for BLM field officials to follow when analyzing impacts to sage-grouse and developing appropriate mitigation. It also establishes the BLM's principles to protect unfragmented habitat; minimize new habitat loss and fragmentation; and manage habitats to maintain, enhance, or restore conditions for sage-grouse. In addition to considering opportunities for onsite mitigation, IM 2012-043 encourages BLM to cooperate with project proponents to develop appropriate off-site mitigation. Through on-site and off-site mitigation, the project proponent should avoid or minimize population-level project effects, as determined by the BLM and respective state wildlife agencies. The IM states when developing such mitigation, the BLM should consider compensating for the short-term and long-term direct and indirect loss of sage-grouse and its habitat.

The BLM, working in concert with the U.S. Fish and Wildlife Service (Service), developed a Framework for Sage-grouse Impacts Analysis (Framework; January 2011), which was applied to the Energy Gateway West Project. The BLM and Rocky Mountain Power decided that the Framework will be revised for application to Energy Gateway South (meeting April 4, 2013). The Framework addresses project-related impacts to sage-grouse habitat that bear directly on listing factors considered by the Service when evaluating the need to provide full listing protection under the Endangered Species Act (ESA). According to the Framework, mitigation is addressed after the NEPA-mandated impacts analysis has been conducted, resulting in an adequate understanding of impacts to sage-grouse populations and habitat, which is described in the EIS. The Framework specifies the use of Habitat Equivalency Analysis (HEA), conducted by the project proponent, as a replicable method for determining mitigation that is scaled to project-related permanent and interim habitat losses.

PacifiCorp will provide a final conservation and mitigation plan documenting the scaled compensatory mitigation to the BLM as a voluntary applicant-committed mitigation measure for sage-grouse. The mitigation plan will offer compensation for all project effects characterized by the Framework that could not be mitigated using other voluntary efforts (e.g., seasonal restrictions, speed limits, etc.). To comply with IM 2012-43 and to maintain consistency with the analysis for the Energy Gateway West Project, PacifiCorp will complete an HEA to determine the amount of compensatory mitigation necessary to offset some of the anticipated disturbance to sage-grouse habitat resulting from the construction, operation, and maintenance of Gateway South. The HEA will quantify mitigation due for a subset of the Project effects characterized by the Framework; the HEA can only be used to quantify mitigation for project effects that are known and quantifiable. Refer to the mitigation plan for

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specifics on mitigation projects and to review PacifiCorp's approach to mitigating project effects characterized by the Framework analysis that could not be modeled in the HEA.

The HEA will be completed for areas of known sage-grouse habitat in Wyoming, Colorado, and Utah that are intersected by the agency preferred alternative selected by the BLM through the NEPA process. This process requires close coordination with the BLM and other stakeholders to ensure the compensatory mitigation identified in the HEA offsets the impacts modeled from the Gateway South project to the extent required by BLM, U.S. Forest Service, and other applicable agency policy. PacifiCorp initiated meetings regarding the HEA with the BLM and other stakeholders prior to the identification of an agency preferred alternative due to the level of effort required to perform the HEA modeling and schedule constraints. The product of these early meetings is this HEA Plan; all HEA analyses will be conducted after the agency preferred alternative is identified in the Draft EIS per the Framework.

The HEA is not an impacts analysis for the Project. The impacts analysis for the Project is separate and is documented in the EIS. Rather, the HEA will be used as a decision-support tool by PacifiCorp to develop a mitigation plan for the agency preferred alternative. The HEA will quantify the mitigation due for the Project effects modeled and the value of conservation project types for offsetting that loss; the mitigation plan will disclose PacifiCorp's proposed mixture of project types and project specifications. It is anticipated that the HEA will model loss of habitat services associated with vegetation loss (direct effect), noise (indirect effect), and human presence (indirect effect). Additional Project effects (such as introduction and spread of invasive species; decreased lek attendance; habitat loss caused by behavioral avoidance of transmission corridors; increased public access and associated impacts [e.g., noise, trash]; and increased predation and nesting by raptors and corvids due to the presence of transmission structures) may not be included in the HEA because of lack of information necessary to establish a quantified relationship between the construction and operation of the transmission line and response by sage-grouse. PacifiCorp may still provide voluntary mitigation to reduce effects that are identified in the EIS analysis, but not quantified in the HEA, in the event that these effects are determined by the agencies to require mitigation.

The following sections describe the HEA process and identify the potential types of mitigation projects that could be used to compensate for the short-term and long-term direct and indirect loss of sage-grouse and its habitat.

OVERVIEW OF HABITAT EQUIVALENCY ANALYSIS

HEA is a science-based, peer-reviewed method of quantifying interim and permanent habitat injuries, measured as a loss of habitat services from pre-disturbance conditions, and scaling compensatory habitat requirements to those injuries (King 1997; Dunford et al. 2004; Allen et al. 2005; Kohler and Dodge 2006; National Oceanic and Atmospheric Administration [NOAA] 2006, 2009). Habitat services include those ecosystem features (physical site-specific characteristics of an ecosystem) and ecosystem functions (biophysical processes that occur within an ecosystem) that support wildlife and human populations (King 1997).

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Habitat services are generally quantified using a metric that represents the functionality or quality of habitat (i.e., the ability of that habitat to provide wildlife “services” such as nest sites, forage, cover from predators, etc.). When wildlife habitat is the primary service of interest, areas with the highest habitat service levels are those areas with highest habitat quality. Interim (or short-term) habitat injuries are those services that are absent during certain phases of the project that would have been available if that disturbance had not occurred. Examples of interim habitat injuries include temporary vegetation losses, temporary soil partitioning, and temporary displacement of wildlife populations. Permanent habitat injuries are those habitat injuries remaining after project completion and interim reclamation and recovery are complete. Examples of permanent habitat injuries include permanent vegetation loss, permanent loss of wildlife or fisheries populations, irrecoverable impacts to soils or water as a result of contamination.

HEA uses a service-to-service approach to scaling. HEA does not assume a one-to-one trade-off in resources (in number of acres, for example); rather, HEA balances the number of services lost with those that are gained as a result of conservation activities (NOAA 2006). For example, 1 acre of land with a diverse vegetative structure and abundant tree canopy can support higher numbers of nesting songbirds (the habitat service of interest) than 1 acre of land with few trees and little vegetative diversity. The two land parcels, although equal in size, provide unequal habitat services.

What Does Habitat Equivalency Analysis Do?

HEA is an economics model that:

- Quantifies current habitat services provided in a project area or landscape (commonly referred to as the baseline habitat service level);
- Quantifies the interim and permanent injuries to the baseline habitat service level; and
- Determines appropriately scaled restoration and conservation activities to offset habitat services lost as a result of project impacts.

Benefits of Habitat Equivalency Analysis

The benefits of HEA include the following.

- High credibility – the approach has been evaluated and documented in scientific peer-reviewed literature and has held up in numerous court cases.
- Analysis is quantitative rather than qualitative in nature.
- Equations are straightforward, but have enough input variables to allow flexibility in project design.
- Provides a replicable method for negotiation of mitigation ratios, acceptable compensatory restoration, and/or fines.
- Valuable planning tool; can be used to evaluate the cost of multiple compensatory mitigation projects.

- Applicable to any ecosystem type where an appropriate habitat services metric can be defined.
- Currently the most commonly used method by natural resource trustees to assess damages to ecosystems.
- Used by federal regulatory agencies, such as the U.S. Fish and Wildlife Service, NOAA, BLM, Environmental Protection Agency, Department of Interior, U.S. Army Corps of Engineers.

When Habitat Equivalency Analysis Should be Used (Chapman 2004)

HEA is an appropriate tool for scaling mitigation when:

- Habitat services can be defined or modeled;
- Quantification of project impacts is possible;
- Replacement of services lost is feasible; and
- Conservation methods are sufficiently known.

COMPONENTS OF COMPENSATION

Compensation for habitat services (that is, the impact to sage-grouse habitat modeled by the HEA) includes two components: 1) recovery of the injured area (primary restoration; Figure 1), and 2) compensation for the interim loss of habitat services occurring prior to full recovery (compensatory restoration; Figure 2).

HEA quantifies the habitat services lost during the lifetime of a project compared to baseline (Area X in Figure 1) and scales the compensatory project so that it provides services that are equal to that loss (Area Y in Figure 2). Baseline refers to the quantity of habitat services that would have existed had the disturbance not occurred. The quantity of services lost (Area X) depends on the extent of the injury and the time required for restoration; actions taken to accelerate the rate of primary restoration would decrease the interim loss of habitat services, requiring less compensatory restoration. In some cases, full restoration of the lost services may not be feasible, in which case the area required for compensation (Area Y) would be larger. Compensatory restoration may occur off-site (such as by the purchase of additional habitat), or on-site through habitat improvements that increase habitat services above baseline (such as non-native vegetation removal, shrub thinning, or understory planting).

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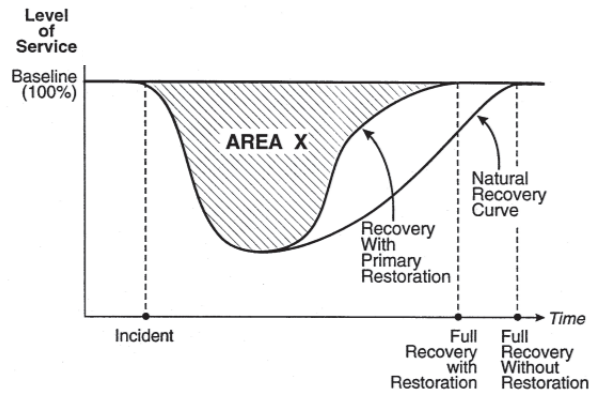


Figure 1. Changes in habitat service level compared to the baseline service level during construction and restoration (copied from King 1997). Area X represents the services lost at an injury site with Primary Restoration expressed as percent of baseline.

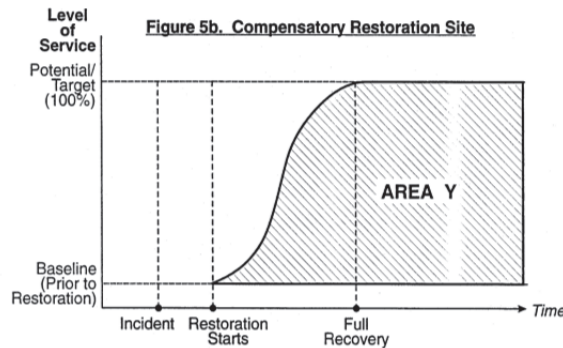


Figure 2. Changes in habitat service level with compensatory restoration (copied from King 1997). Area Y represents the services gained at the compensatory restoration site expressed as percent of potential/target level less baseline (pre-restoration) percent.

MEASURING HABITAT SERVICES (ECOLOGICAL ECONOMICS)

Quantifying the services provided by an ecosystem is a complex task. This complexity can be reduced through the use of an attribute, or metric, that provides a measure of the services of interest. The metric must be able to capture the relative differences in the quality and quantity of services being provided before and after restoration and between primary and compensatory sites (NOAA 2009).

Measurements of habitat services over the lifetime and area of a project are used in the HEA. These measurements have three components: land area, service level (or habitat quality level), and time. The relative service level can be quantified using a metric that measures or scores one or more key habitat elements for a species or wildlife community of interest. Examples of key habitat elements are vegetation stem density, vegetation type, nest density, percentage of canopy cover, and proximity to critical habitat. Habitat services are commonly expressed in service-acres or service-acre-years.

DATA NEEDED FOR HABITAT EQUIVALENCY ANALYSIS

Developing appropriate baseline metrics, quantifying project impacts, and identifying appropriate compensatory mitigation requires substantial and consistent datasets. Data for the following are needed to conduct an HEA.

- Evaluation of baseline services at the primary project site.
- Extent of the disturbance at the primary project site.
- Project timeline.
- Percentage of services predicted to be lost during initial (short-term) disturbance and expected rate of recovery with restoration at the primary project site.
- Timeline for compensatory restoration.
- Services associated with compensatory projects.
- Timeline of compensatory projects.
- Discount rate for each time period (3% is commonly used in HEAs).

HABITAT EQUIVALENCY ANALYSIS PROCESS FOR GATEWAY SOUTH

Completion of the HEA process for the Project Agency Preferred Alternative will require close coordination with the BLM and other appropriate agencies and stakeholders. Such coordination will ensure that the best available scientific data are being used, the habitat service metric is appropriate for the species-specific habitat affected in the Project area, the results of the HEA are understood, and the compensation offsets the interim and permanent loss of habitat services modeled. The following steps will be completed as part of the development of the HEA for the Gateway South.

1. Establishing baseline habitat services prior to disturbance.

PacifiCorp will work closely with the appropriate agencies and stakeholders to finalize a habitat services metric that will quantify sage-grouse habitat services. Appendix A provides a description of the habitat services metric that will serve as the basis for quantifying baseline habitat services, Project-related habitat service losses, and the benefits of habitat restoration and mitigation projects. This habitat services metric has considered the best available scientific information regarding sage-grouse habitat and response to disturbance. This information was used to define variables in the metric when there was a consistent trend in the literature (i.e., the studies measured a consistent response of sage-grouse to its environment), and when existing data were available to inform their use. Appendix B describes how this metric will be applied to establish a baseline measure of habitat services for the Project area.

2. Quantifying the permanent and interim losses to the baseline service level that result from the Project disturbance.

Permanent and interim losses of habitat services caused by the construction and operation of Gateway South will be subtracted from the baseline habitat services. Direct and indirect losses of habitat services over the life of the Project will provide the basis for identifying the amount and type of mitigation necessary to offset the losses that can be quantified in the HEA. Appendix C describes the approaches that will be used to quantify the direct and indirect losses that will occur as a result of Project construction and operations.

3. Identifying appropriate mitigation projects that may be used to compensate for lost services.

PacifiCorp will work with the agencies and stakeholders to identify mitigation projects that may be used to compensate for the permanent and interim losses of habitat services. All mitigation projects would be subject to appropriate land management agency or landowner approval, permits, and planning. Appendix D describes the methods that will be used to quantify habitat service gains resulting from mitigation projects. Mitigation projects likely to be considered and quantified in the HEA include, but are not limited to the following.

- Fence marking, modification, or removal – Fences that pose a high collision risk for sage-grouse (Stevens et al., in press) would be marked, modified, or removed to reduce or remove threats to sage-grouse. Appropriate land management agency or landowner coordination would be important to ensure fence-related conservation activities support current and future land use objectives.
- Sagebrush restoration or enhancement projects – Sagebrush restoration or enhancement projects might include seeding sagebrush and associated understory vegetation into previously disturbed or burned areas or transplanting already established sagebrush stems and seedlings into areas where sagebrush has been removed or thinned. Appropriate land management agency or landowner coordination would be important to ensure sagebrush enhancement activities support ongoing and future land use objectives.
- Conifer removal – In areas where conifers are encroaching into suitable sage-grouse habitat, conifer removal (specifically removal of piñon pine and juniper) could be used to reduce habitat fragmentation and to restore previously unsuitable habitat. Priorities for conifer removal would include lop-and-scatter removal of Phase I¹ conifer encroachment and cut-pile-dispose or mastication of Phase II (mid conifer encroachment). Phase III conifer treatment would also be evaluated but unlikely to

¹Miller et al. (2005) characterized the three stages of woodland succession:

Phase I - early-succession, trees are present but shrubs and herbs are the dominant vegetation that influence ecological processes (hydrologic, nutrient, and energy cycles) on the site;

Phase II - mid-succession, trees are co-dominant with shrubs and herbs and all three vegetation layers influence ecological processes on the site;

Phase III - late-succession, trees are the dominant vegetation and the primary plant layer influencing ecological processes on the site.

be selected as an appropriate compensatory tool. Appropriate land management agency or landowner coordination would be important to ensure activities support ongoing and future land use objectives.

- Conservation easements – Where possible, conservation easements could be used to provide long-term contractual protection of high-quality sage-grouse habitat, conservation efforts, and improvement projects. PacifiCorp's ability to acquire conservation easements would be dependent upon the willingness of private landowners to participate in a conservation program. Landowner coordination would be important to ensure activities support ongoing and future land use objectives.

In the HEA, the benefits of mitigation projects must be quantifiable using the habitat services metric. The above list consists of those mitigation projects with benefits that could be quantified in the HEA. As the Gateway South HEA is completed for the Agency Preferred Alternative, other mitigation projects are likely to be identified. Additional mitigation projects with benefits that cannot be quantified in the HEA will be considered separately and their compensatory value determined in coordination with the lead agencies and other stakeholders. PacifiCorp's mitigation plan will describe the mixture of mitigation projects proposed to offset the effects of Gateway South, and will consider agency preferences for project types by project segment.

4. Quantifying the amount of mitigation necessary to compensate for the losses to baseline services that remain after project implementation.

Once final mitigation projects have been identified and approved by PacifiCorp, the lead agencies, and involved stakeholders, the average habitat service gain and cost per service returned² will be quantified for each project type. The resulting values will be balanced with the services lost to determine the compensatory mitigation appropriate to offset the permanent and interim loss of sage-grouse habitat services resulting from development of Gateway South. Appendix C describes the approach that will be used to identify appropriate levels of compensatory mitigation for direct and indirect losses of habitat services modeled that will occur as a result of project construction and operations. A final conservation and mitigation plan/report documenting the scaled compensatory mitigation would be provided to BLM as a voluntary applicant-committed mitigation measure for sage-grouse.

² Habitat service gains are averaged among several hypothetical mitigation projects that are modeled. Mitigation project costs are obtained for previously-conducted projects, standardized per acre or mile of application, and averaged among projects.

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APPENDIX A

Proposed Habitat Service Metric for the Gateway South Transmission Line

DEVELOPMENT OF HABITAT SERVICE METRIC FOR HABITAT EQUIVALENCY ANALYSIS

PacifiCorp has convened a group comprised of agency and stakeholder representatives to work with consultants on the Habitat Equivalency Analysis (HEA) (the HEA Technical Working Group [HTWG]). From Colorado, the HTWG includes a representative from the U.S. Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service, Colorado Parks and Wildlife, and Moffat County. Utah representatives are from the BLM, U.S. Fish and Wildlife Service, Utah Division of Wildlife Resources, and Uintah County. Wyoming representatives are from the BLM, the U.S. Fish and Wildlife Service, Wyoming Game and Fish, the Saratoga-Encampment-Rawlins Conservation District, and the Little Snake River Conservation District. Consultants participating in the HTWG include SWCA Environmental Consultants, EPG, and EnviroIssues.

The HTWG developed a habitat service metric for the greater sage-grouse (*Centrocercus urophasianus*) (sage-grouse) using variables identified in the peer-reviewed literature as representative of sage-grouse habitat. Habitat service levels are intended to reflect both the quality of the habitat and the ability of the birds to use the habitat. For each of the metric variables, a habitat service score ranging from 0 to 3 (no services [contributing no value to habitat] to high services [optimal habitat]) was assigned, similar to the sage-grouse habitat assessment framework developed by Stiver et al. (2010) and the sage-grouse habitat suitability index developed by LaGory et al. (2012). Scoring habitat services is a critical step in the HEA process, because it provides a way to measure the relative quality of specific habitat functions in a specific area.

The scores for this HEA are primarily based on information contained in the literature regarding sage-grouse habitat use and selection. When literature did not allow for direct assignment of value ranges for HEA scores, professional judgments, which were based on peer-reviewed literature, were used. Professional judgments are associated with specific literature references when possible and/or confirmed with academic and agency biologists.

When a basic life requisite of sage-grouse is absent (vegetation is absent, the area is forested, or high levels of disturbance are present), the cell being scored is assigned a total service value of 0. When a measurements for particular variable within the metric (e.g., % sagebrush cover) matches literature-based descriptions of sub-optimal conditions, that variable is given a service score of 0 (contributing no value to habitat), 1 (poor habitat), or 2 (moderate habitat). For example, sagebrush cover <1% would score a 0, cover of 1%–5% would score a 1, and cover of 5%–15% or >35% would score a 2 for that variable. When measurements for a particular variable match literature-based recommended conditions, that variable is given a service score of 3 (optimal habitat). For example, sagebrush cover of 15%–35% would score a 3 for that variable.

Scoring of the variables is categorical and each variable is given the same weight in the model. This approach is based on the best available data and is consistent with the general approach of LaGory et al. (2012). LaGory et al. (2012) describe their approach as follows:

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In general, there was insufficient information in existing studies to determine relationships among variables and habitat suitability or relative contributions between variables/components. Therefore, for simplicity, we developed piecewise linear functions of suitability based on the assumption that all variables are of equal weight and applied these functions to geospatial layers to generate indices ranging from 0 (poor) to 100 (optimal). This approach is similar to that used for many of the U.S. Fish and Wildlife Service (USFWS) Habitat Suitability Index models in their Habitat Evaluation Procedure, (available at <http://www.fws.gov/policy/ESMindex.html>).

While the individual variables are not weighted, the number of variables relating to a habitat attribute (e.g., six for vegetation vs. one for slope) and the size of the buffers (e.g., 6.4 kilometers [km] for leks vs. 2 km for fences with high collision risk) give some attribute categories more influence than others. In the metric, there are three variables that score sagebrush characteristics (sagebrush abundance index, sagebrush % cover, and sagebrush canopy height), so areas that are not dominated by sagebrush will score low for these three variables, resulting in a lower overall score.

Sage-grouse habitat suitability publications vary in their baseline environmental conditions affecting a particular study site. Even studies within the same state may describe different suitable habitat conditions depending on elevation, precipitation zone, and other geographic or climatic factors affecting each study site.

No specific habitat studies have been conducted on the Project's transmission line corridor alternatives, therefore the habitat metrics described below mostly rely on information presented in BLM et al. (2000), Cagney et al. (2009), Connelly et al. (2000), Connelly et al. (2011), and other summary publications. Specific citations are given to support the habitat model framework when applicable.

A single habitat service metric is applied to the whole Project corridor in order to standardize results. This approach assumes that optimal habitat or poor habitat for sage-grouse looks the same (that is, measures the same for the variables in the metric) regardless of its location, despite regional differences in habitat features and availability.

As a result, the best available habitat at the edge of the species' range may not score as high as the best available habitat in the center of the species' range, unless they have the same measurements for the variables in the metric. The following sections describe the development of the habitat service model variables.

METRIC OF SAGE-GROUSE HABITAT SERVICES

The metric is only applied to areas that contain sage-grouse habitat. To more accurately model sage-grouse utilization areas, land cover types typically avoided by sage-grouse are masked from the analysis area before the metric is applied. Disturbances of these lands require no mitigation in the HEA. These land cover types include all forest types, urban areas, open water, roadways, well pads, mine footprints, areas <100 meters (m) from roadways with >6,000 annual average daily traffic (AADT), and <25 m of paved roads and heavily traveled

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gravel roads (multiple sources per U.S. Fish and Wildlife listing decision in Federal Register; Johnson et al. 2011).

The metric for sage-grouse habitat services used in this HEA is a simple additive model (Table A1). Each cell in the analysis area is scored separately by summing the scores of Variables 01 through 09. Each variable is described in detail below.

DESCRIPTIONS OF METRIC VARIABLES

Anthropogenic Variables

Habitat within and surrounding the Project transmission line corridor is currently influenced by fences used for livestock management (e.g., to control livestock movements and vegetation use within grazing allotments and pastures, to delineate or protect private property and agricultural croplands, and to restrict livestock from improved and unimproved roadways); and by roads, mines, wells, and existing transmission substations that fragment the vegetative landscape and alter wildlife use patterns. Two anthropogenic-influenced variables were used to address these effects on sage-grouse habitat suitability.

VAR01 and VAR02 Distance to Roads and Highways

Research into the effects of roads on sage-grouse is varied. For instance in Colorado, Rogers (1964) mapped 120 leks with regard to distance from roads and found that 42% of leks were over 1.6 km (1 mile) from the nearest improved road, but that 26% of leks were within about 90 m (about 100 yards) of a county or state highway, and two leks were on a road. Connelly et al. (2004) also note the use of roads for lek sites. In contrast, Craighead Beringia South (2008) reported results from a 2007 to 2009 study of sage-grouse seasonal habitat use in Jackson Hole, Wyoming. Results indicate that sage-grouse avoid areas within approximately 100 m of paved roads. Similarly, Pruett et al. (2009) found that lesser prairie-chickens avoided one of the two highways in the study by 100 m; however, some prairie-chickens crossed roads and had home ranges that overlapped the highways, thus roads did not completely exclude them from neighboring habitat. Johnson et al. (2011) examined the correlation between trends in lek attendance and the environmental and anthropogenic features within 5- and 18-km buffers around leks. They found that lek attendance declined over time with length of interstate highway within 5 km, although the authors note that this trend was based on relatively few data points and no pre-highway data were available for comparison. Interstate highways >5 km away and smaller state and federal highways had little or no effect on trends in lek attendance. Thresholds less than 5 km were not examined.

In the habitat services metric, those habitats located within 100 m of a high-traffic paved road (interstate highway or high-traffic federal or state highway with >6,000 AADT, for example), or within 25 m of a low-traffic paved road (low-traffic federal or state highway, or other paved roads, for example) were considered to provide no services to sage-grouse due to traffic and associated noise/human disturbance and were given a score of 0 (no services). Unpaved roads with high traffic loads (for example, oil and gas service roads, mine service roads, etc.) provide similar disturbance levels as paved roads with similar traffic loads (e.g., low-traffic state highway).

Table A1. Anthropogenic and Habitat Variables Used as a Metric of Sage-grouse Habitat Services

Variable Number	Variables	3	2	1	0	Primary Citations
VAR01	Distance to interstate highway or high-traffic (>6,000 AADT) federal or state highway (meters)	>1,000	650–1,000	100–650	NA	Craighead Beringia South (2008); Johnson et al. (2011); Pruett et al. (2009)
VAR02	Distance (meters) to low-traffic (<6,000 AADT) federal or state highways, other paved roads, heavily travelled gravel roads, well pads, mine footprints, and transmission substations	>200	50–200	25–50	NA	Connelly et al. (2004); Craighead Beringia South (2008); Johnson et al. (2011); Pruett et al. (2009)
VAR03	Distance to fence segments that pose a high collision risk for sage-grouse (kilometers)*	>2.0	0.4–2.0	<0.4	N/A	Christiansen (2009); Stevens et al. (2012); Stevens et al. (in press)
VAR04	Percent slope	<10	10–30	30–40	>40	Beck (1977); Lincoln County Sage Grouse Technical Review Team (2004)
VAR05	Distance to occupied lek [†] (kilometers)	0–6.4	6.4–8.5	>8.5	N/A	Cagney et al. (2009); Connelly et al. (2000); Connelly et al. (2011); Holloran and Anderson (2005)
VAR06	Sagebrush abundance index (% of vegetation that is sagebrush within a 1 km ² moving window)	50–95	30–50 or >95	10–30	0–10	Carpenter et al. (2010); Walker et al. (2007); Aldridge and Boyce (2007); Aldridge et al. 2008; Wisdom et al. (2011)
VAR07	Percent sagebrush canopy cover	15–35	5–15 or >35	1–5	<1	Cagney et al. (2009); Connelly et al. (2000); Stiver et al. (2010)

Table A1. Anthropogenic and Habitat Variables Used as a Metric of Sage-grouse Habitat Services

Variable Number	Variables	3	2	1	0	Primary Citations
VAR08	Sagebrush canopy height (centimeters)	30–80	20 to <30 or >80	5–20	<5	Crawford et al. (2004); Connelly et al. (2000); Stiver et al. (2010)
VAR09	Distance of habitat to sage or shrub dominant (meters)	<90	90–275	275–1,000	>1,000	BLM et al. (2000); Connelly et al. (2000); Lincoln County Sage Grouse Technical Review Team (2004)

* Allotment boundaries were used as a surrogate for fence lines. The model by Stevens et al. (in press) was used to identify fence segments that posed a high risk for sage-grouse collision.

† Leks were classified as active if their 10-year attendance average was greater than 0.

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To characterize this disturbance in the model, mine footprints and well pad footprints were classified and scored as if they were low-traffic roads, so that there are no habitat services within 25 m of these disturbances. Transmission substations (the existing Aeolus and Clover substations at either end of the Project) and series compensation stations were also classified and scored as if they are low-traffic roads in the model to account for the noise and human presence associated with these facilities.

Those habitats located farther than 200 m and 1,000 m, respectively, of a low-traffic road or high-traffic road were considered the most serviceable to sage-grouse (that is, exhibited no decrease in lek attendance) and given a score of 3. A logarithmic curve was fit between the highest and lowest categories so that score increased with distance from the road to estimate the distance breaks associated with scores 1 and 2. A logarithmic rate of change simulates sound attenuation rates better than a linear rate of change (Crocker 2007). Conflicting research results regarding sage-grouse use near and on unpaved resource/collector roads (e.g., two-track roads) did not allow for quantification of the disturbance caused by these roads in the model.

While the application of distances to all scores (0–3) is not perfectly supported in the peer-reviewed literature, our approach places a penalty upon habitats that are bisected by all types of large roadways. Penalties are higher for roads that typically have higher traffic levels and risk to sage-grouse (e.g., mortality from collision, noise disturbance) than less-utilized secondary roads that generally have less traffic and implied risk.

VAR03 Distance to Fences that Pose a High Risk for Collision

Fence collisions have been reported as a cause of significant injury and mortality to grouse species (sage-grouse [Braun 2006; Call and Maser 1985; Connelly et al. 2004; Christiansen 2009; Danvir 2002; Stevens et al. 2012]; lesser prairie-chicken [Wolfe et al. 2007]; ptarmigan [Bevanger and Broseth 2000]; and red grouse, black grouse, and capercaillie [Baines and Summers 1997; Catt et al. 1994; Petty 1995]). In addition to direct mortality, fences provide corridors for mammalian predators increasing the opportunity for predation of hens and broods (Braun 1998). Unlike the other variables in the metric, which are primarily meant to characterize use and avoidance of habitat by sage-grouse, the distance to high risk fences was added to account for the potential direct loss of sage-grouse (not sage-grouse avoidance of fences).

In Wyoming, Christiansen (2009) reported preliminary results of a multiple-year study (2005–ongoing) near Farson on sage-grouse fence strikes and mortalities and the utility of fence markers on reducing collisions. After installation of fence markers on portions of high-risk fences, grouse mortality decreased by 70%. Although the study did not compare the number of strikes with regard to distance to lek, the author recommends that fences should not be located within 0.25 mile (0.4 km) of leks.

In Idaho, Stevens (2011) and Stevens et al. (2012) evaluated the environmental features associated with sage-grouse fence collision risk, and tested the efficacy of reflective vinyl fence markers to reduce collision rates at eight study sites. Modeling predicted marking reduced collision rates by 74% at the mean lek size and fence distance from the lek. Collision probability varied by region, topography, fence type, fence density, and lek proximity. Areas

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with high slope or terrain ruggedness generally showed lower collision risk than flat areas. Collisions were more common on fence segments bound by steel t-posts with spans between posts exceeding 4 m. Collision probability increased with fence length per km² and proximity to nearest active lek. Stevens et al. (2012) recommended 2-km mitigation buffers around leks in high-risk areas, which is consistent with the recommendation by Braun (2006).

For this variable, fences segments having a high risk for collision were identified using the model by Stevens et al. (in press), which is largely informed by fence proximity to leks and terrain roughness. All habitats within 0.25 mile (0.4 km) of fences with high collision risk were scored as a 1 (few services) for this variable due to the increased risk that sage-grouse in those areas might collide with that fence (Christiansen 2009). As the distance to fence increases, there is decreased likelihood of a sage-grouse striking a fence and potentially less risk of depredation by mammalian and avian predators. Consistent with recommendations by Stevens et al. (2012) and Braun (2006), habitats >2 km from high-risk fence segments were given the highest score of 3. A linear relationship was then used to determine the remaining metric scores (i.e., score of 2 between 0.4 and 2.0 km, and score of 1 <0.4 km of a fence). Risk for collision was determined without regard for fence type or configuration, because data available were not sufficient to differentiate among them in the model.

VAR04 Slope

Slope was used to refine sage-grouse habitat potential. Sage-grouse generally use flat or gently sloping terrain (Connelly et al. 2011; Eng and Schladweiler 1972; Nisbet et al. 1983; Rogers 1964). Beck (1977) plotted the distribution of 199 sage-grouse flocks in Colorado and found that 66% of flocks were on slopes less than 5% and only 13% of flocks were on slopes greater than 10%. Areas with slopes greater than 40% are unsuitable for nesting habitat (Lincoln County Sage Grouse Technical Review Team 2004), but still have some value to sage-grouse and should be retained in the model (professional judgment of the Gateway South HTWG). Therefore, areas with less than 5% slope were assigned a habitat service score of 3, and those exceeding 10% subjectively received incrementally lower habitat service scores. Slopes >40% did not add value to the habitat and received a score of 0 for this variable, but these areas may provide habitat services depending on the scores for the other variables.

A terrain roughness index (TRI) was evaluated for use in place of the slope variable, as some studies have shown that it is a better indicator of sage-grouse use (Carpenter et al. 2010; Doherty et al. 2008; Doherty et al. 2010; Dzialak et al. 2011). However, there was substantial variation in the methods used to calculate TRI (e.g., measure of roughness used and analysis window size) and region evaluated (e.g., Alberta, Canada, vs. Powder River Basin, Wyoming) by these studies. Given this variation, it was not possible to identify literature-supported cutoffs between scores for use in the model.

VAR05 Distance to Lek (10-year Average Count >0 Males)

Current sage-grouse habitat management guidance uses occupied leks as focal points for nesting habitat management (Connelly et al. 2000; Connelly et al. 2011); therefore, distance to lek was used as a variable in the habitat services metric. These guidelines recommend protecting sagebrush communities within 3.2 km of a lek in uniformly distributed habitats and 5.0 km in non-uniformly distributed habitats. Holloran and Anderson (2005) studied nesting sage-grouse at 30 leks in central and western Wyoming and determined that 45% and 64% of

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female sage-grouse nested within 3.2 km and 5.0 km, respectively, of the lek where the hen was radio-collared. Moreover, statistical analyses suggested that the area of interest for nesting sage-grouse should be truncated at 8.5 km from a lek. Similar frequencies are reported in Cagney et al. (2009)—66% within 5.0 km and 75% within 6.4 km of a lek where the female bred.

Female sage-grouse do nest at distances greater than 8.5 km (farthest distance reported in Holloran and Anderson [2005] was 27.4 km), so all distances >8.5 km from occupied leks were given a service score of 1 to reflect some potential use by nesting sage-grouse. Areas within 6.4 km of a lek provide the highest service level, because they provide female grouse with forage, roost sites, and cover from predators or inclement weather during the lekking season, in addition to containing lekking habitat and nesting habitat (Cagney et al. 2009). Therefore, areas within 6.4 km of an occupied lek were assigned a service score of 3 for this variable. Between these distances (6.4–8.5 km), areas were assigned a score of 2 for this variable.

VAR06 Sagebrush Abundance Index

Walker et al. (2007) found that the proportion of habitat that was sagebrush within a 6.4-km moving window was a strong predictor of lek persistence in the Powder River Basin of Wyoming. The moving window is an analysis area that is larger than and centered on the cell being scored; in this case, the window is a 6.4-km buffer that moves as the cell being scored is changed. Areas with less than 30% of sagebrush within 6.4 km of the lek center had a lower probability of lek persistence. Aldridge and Boyce (2007) also used a moving window (1 km²) to measure sagebrush cover and abundance. Their resource selection function found that sage-grouse selected nesting habitat that contained large patches (1 km²) of sagebrush with moderate canopy cover and moderate sagebrush abundance (i.e., heterogeneous distribution of sagebrush). Carpenter et al. (2010) found similar results in Alberta, Canada. Their top resource selection functions included a quadratic function for sagebrush abundance, which indicates that areas of moderate sagebrush abundance were selected more frequently than areas of homogenous sagebrush.

Aldridge et al. (2008) [per Wisdom et al. (2011)] found that at least 25% of the landscape in a 30.77-km analysis area needed to be dominated by sagebrush for sage-grouse persistence, with 65% being preferred. Wisdom et al. (2011) found that landscapes with less than 27% sagebrush were not different from landscapes from which sage-grouse have been extirpated. Similar to Aldridge et al. (2008), Wisdom et al. (2011) found that 50% sagebrush across a landscape was a good indicator of sage-grouse persistence.

The Gateway South HTWG indicated that sage-grouse prefer higher sagebrush abundance in the southern part of their range (i.e., the Project Area) than is indicated by these studies. For example, the Colorado Parks and Wildlife Avian Research Center has generally found a positive linear relationship between sagebrush abundance and measures of habitat selection (Brian Holmes, Colorado Parks and Wildlife, personal communication with Jon Kehmeier, SWCA, on February 13, 2013). Colorado Parks and Wildlife has not observed an upper inflection point in the proportion of the landscape covered in sagebrush where use or selection begins to drop, and suggest that the difference may be due to the structure and composition of

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the sagebrush community (that is, silver sagebrush mixed grassland rangelands of Alberta [Aldridge and Boyce 2007; Carpenter et al. 2010] vs. big sagebrush steppe [Project Area]).

Sagebrush covering 50% to 95% of the landscape scored a 3 for this variable (Aldridge et al. 2008; Wisdom et al. 2011; professional judgment of the HTWG). Sagebrush covering 30% to 50% or >95% scored a 2 for this variable (Aldridge et al. 2008). Sagebrush covering 10% to 30% scored a 1 (Walker et al. 2007; Wisdom et al. 2011) and sagebrush covering less than 10% scored a 0 for this variable.

VAR07 Sagebrush Canopy Cover

Recommended sagebrush canopy cover for sage-grouse habitat varies seasonally. Seasonal habitats were not modeled, but seasonal differences in the selection for sagebrush cover was considered when developing habitat services metrics. The seasonal habitat needs of sage-grouse are described below, followed by scoring of percent sagebrush cover in the habitat services metric.

Seasonal Habitat Use

Nesting

Connelly et al. (2000) cite 13 references to sagebrush coverage that range from 15% to 38% mean canopy cover surrounding the nest. Citations contained within Crawford et al. (2004) reported 12% to 20% cover and 41% cover in nesting habitat. In their species assessment, Connelly et al. (2000) conclude that 15% to 25% canopy cover is the recommended range for productive sage-grouse nesting habitat. This is also the range identified in the sage-grouse habitat assessment framework (Stiver et al. 2010) as providing the highest service level for sage-grouse based on a review of the available literature. Wallestad and Pyrah (1974) reported that successful nests were in stands where sagebrush cover approximated 27%. This cover range is used as a goal in some sage-grouse management guidelines (Bohne et al. 2007; BLM et al. 2000). Cagney et al. (2009) guidelines for grazing in grouse habitat, which use information synthesized from over 300 sources, state that hens tend to select an average 23% live sagebrush canopy cover when selecting nesting sites.

Sage-grouse in Utah use habitats with higher sagebrush canopy cover than is observed in the northern and eastern portions of the species range, possibly due to the relative scarcity of understory grasses in Utah (Renee Chi, BLM, personal communication with Ann Widmer, SWCA, on March 22, 2013). Nest sites in Wildcat Knoll (part of the Emery-Sanpete population of Utah) were located in areas with an average of 33% shrub canopy cover for successful nests and 22% for unsuccessful nests (Perkins 2010). Nests (n = 50) in Parker Mountain were located at sites with an average canopy cover of 35.5% for big sagebrush and 32% for big sagebrush mixed with black sagebrush (Chi 2004; Renee Chi, BLM, personal communication with Ann Widmer, SWCA, on March 22, 2013). In the Sheeprock sage-grouse population, nest site shrub canopy cover measured an average of 62% in 2005 and 83.5% in 2006 (Robinson 2007).

Brood Rearing

Connelly et al. (2000) found that productive brood-rearing habitat should include 10% to 25% cover of sagebrush. This is the range used as a goal in sage-grouse management guidelines (Bohne et al. 2007; BLM et al. 2000). While sagebrush is a vital component of sage-grouse

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habitat, very thick shrub cover may inhibit understory vegetation growth and reduce the birds' ability to detect predators (Wiebe and Martin 1998).

Again, sage-grouse in Utah may use areas with higher canopy cover than is typical throughout the northern and eastern parts of their range. Grouse in the Sheeprock population were documented using areas with an average shrub canopy cover of 73% during brood rearing in 2005 and 2006 (Robinson 2007).

Winter

Connelly et al. (2000) cite 10 references to sagebrush coverage in winter-use areas that range from 15% to 43% mean canopy cover (Crawford et al. [2004] also cite two of these references in their assessment); however, they considered a canopy of 10% to 30% cover (above the snow) as a characteristic of sagebrush needed for productive sage-grouse winter habitat. This is the cover range used as a goal in sage-grouse management guidelines (Bohne et al. 2007; BLM et al. 2000). Sage-grouse in Utah may prefer higher cover in winter. In Emma Park, areas of high sagebrush cover were used disproportionately to their availability on the landscape, with an average of 38.3% sagebrush canopy cover in winter-use areas (Crompton and Mitchell 2005).

Scoring in Habitat Services Metric

In general, the recommended sagebrush cover for nesting habitats was intermediate to, and overlapped that of, brood-rearing and winter habitats. Thus, favorable conditions for nesting were given the highest scores for percent sagebrush cover in the sage-grouse habitat services metric.

This variable used the scores assigned by Stiver et al. (2010) for sagebrush cover categories in sage-grouse nesting habitat, with a slight adjustment to account for use of higher canopy cover in Utah. This adjustment is also consistent with the Colorado Greater Sage-Grouse Conservation Plan (Colorado Division of Wildlife et al. 2008). Sagebrush percent canopy cover of 15% to 35% was assumed to provide the highest level of services (score of 3) to nesting sage-grouse. This includes canopy covers that are 10% higher than the average ranges provided in Connelly et al. (2000) and Cagney et al. (2009). Areas with slightly less or more cover than this (55–15 or >35) were given a habitat services score of 2. Habitats with <5% cover received a score of 1.

VAR08 Sagebrush Canopy Height

Sagebrush canopy height is an important aspect of all sage-grouse seasonal habitats. As described above, seasonal habitat models will not be developed for the Project. However, seasonal habitat requirements were considered when developing habitat metric values. The seasonal habitat needs of sage-grouse are described below, followed by scoring of percent sagebrush cover in the habitat services metric.

Seasonal Habitat Use

Nesting

Gregg et al. (1994, cited in Crawford et al. 2004) found that the area surrounding successful nests in Oregon consisted of medium-height (40 to 80 centimeters [cm]) sagebrush. Connelly et al. (2000) cite 11 references to sagebrush height that range from 29 to 79 cm mean height.

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In their assessment, Connelly et al. (2000) conclude that sagebrush with a height of 30 to 80 cm is needed for productive sage-grouse nesting habitat in arid sites and 40 to 80 cm in mesic sites. These ranges are supported by Stiver et al. (2010), who recommend a range of 30 to 80 cm, and BLM et al. (2000), which state that optimum sage-grouse nesting habitat consists of sagebrush stands containing plants 40 to 80 cm tall.

Winter

Important structural components in winter habitat include medium to tall (25–80 cm) sagebrush stands (Crawford et al. 2004). Connelly et al. (2000) cite 10 references to sagebrush height in winter habitat that range from 20 to 46 cm above the snow. Two studies measured the entire plant height and provided a range from 41 to 56 cm. In their assessment, Connelly et al. (2000) conclude that characteristics of productive winter habitat include sagebrush that is 25 to 35 cm in height above the snow. This is the height range used as a goal in sage-grouse management guidelines (Bohne et al. 2007; BLM et al. 2000).

Scoring in Habitat Services Metric

Sagebrush canopy heights that provided high-quality nesting habitat generally also provided high-quality winter habitat for sage-grouse. Thus, favorable conditions for nesting were given the highest scores for sagebrush canopy height in the sage-grouse habitat services metric.

The sagebrush cover scores assigned for nesting habitat in the sage-grouse habitat assessment framework by Stiver et al. (2010) to different sagebrush cover categories were assigned to this variable. Areas of sagebrush with a height of 30 to 80 cm were assigned a habitat services score of 3. As sagebrush canopy height decreases, the value of a sagebrush plant to provide cover for nesting females and their nests is diminished. Additionally, low-lying sagebrush is less available to sage-grouse during the winter due to snow cover. Areas with canopy heights greater than 80 cm provided intermediate levels of services because they may provide relatively poor cover for nesting sage-grouse and have foliage that is difficult for sage-grouse to access during mild and moderate winters. Sites with lower and higher sagebrush canopy heights were scored lower (sagebrush 12 to <30 cm or >80 cm in height received a score of 2). Areas with minimal sagebrush canopy heights were considered to have the lowest habitat service value (sagebrush <20 cm received a score of 1).

VAR09 Distance to Vegetation Dominated by Sagebrush or Shrub

Sage-grouse use shrubby habitats including sagebrush during the brood-rearing season (Connelly et al. 2000) and for grouse movement and dispersal (Stiver et al. 2010). Close proximity to shrubby vegetation increases the service value of all vegetation types modeled because shrubby vegetation provides cover from predators, facilitates grouse movement, and supports population connectivity.

The Lincoln County Sage Grouse Technical Review Team (2004) identified proximity to sagebrush cover as an important component in habitat suitability of non-sagebrush, brood-rearing habitats (e.g., mesic lowland habitats, hay meadows). The Team considered brood-rearing areas within <100 yards, 100 to 300 yards, and >300 yards of sagebrush cover as suitable, marginal, and unsuitable habitat, respectively. Similarly, Stiver et al. (2010) considered mesic habitats <90 m, 90 to 275 m, and >275 m of sagebrush to be suitable, marginal, and unsuitable late brood-rearing/summer habitat, respectively. These

Appendix A. Proposed Habitat Service Metric for the Gateway South Transmission Line

categorizations support the concept of increasing service level with proximity to shrubs, particularly sagebrush.

The distance to vegetation dominated by sagebrush or shrub variable (VAR09) measured the distance of the cell being scored (regardless of its vegetation type) to the next nearest cell that was dominated by sagebrush or a shrub species, including willows. For this variable, cells <90 m, 20 to 275 m, and >275 m to a cell dominated by a shrub species were assigned scores of 3, 2, and 1, respectively. The scoring was applied to all vegetation types, because this variable is relevant to bird movement and dispersal from all habitat types.

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APPENDIX B

Quantification of Baseline Habitat Service Level

1 **QUANTIFICATION OF BASELINE HABITAT SERVICE LEVEL**

2 The pre-construction baseline of the habitat services will be based on existing datasets to the
3 extent possible. It is not anticipated that additional data collection will be necessary to
4 complete the Habitat Equivalency Analysis (HEA). The baseline service level will be
5 determined by applying the habitat service metrics described in Appendix A to the
6 Assessment Area that is identified for the Project. For other similar projects, the Assessment
7 Area included the footprint of the project and a buffer around the footprint, because greater
8 sage-grouse (*Centrocercus urophasianus*) (sage-grouse) habitat service losses were expected
9 to extend beyond the area of direct disturbance.

10 ESRI ArcGIS ArcInfo 10.X, Spatial Analyst, and ModelBuilder software and tools will be
11 used to conduct analyses. To facilitate calculations across the entire assessment area, it is
12 anticipated that all data will be converted to a raster/grid format. Raster or grid algebra
13 processing is significantly faster for a project of this size.

14 **PREPARATION OF GIS MODEL INPUT LAYERS**

15 Habitats within and surrounding the corridor for the preferred alternative will be summarized
16 in a series of representative raster layers for the 9 metric variables (see Appendix A). These
17 nine variables consist of data representations within the project area for human disturbance,
18 landscape characteristics, proximity to sage-grouse lek locations, and vegetation
19 characteristics that may influence the use of habitat by sage-grouse. A spatial resolution of 30
20 meters (m) is anticipated to be sufficient to capture a ‘landscape level’ perspective of habitat
21 across the Assessment Area.

22 Representative raster data will be created for each variable in the HEA metric (Appendix A).
23 Scores for each cell in each raster will be assigned per the variable scores listed in Table A1
24 of Appendix A. The following sections describe the datasets anticipated to be necessary to
25 describe each of the variables described in Appendix A.

26 **Lands Excluded From Analysis**

27 As described in Appendix A, land cover types and terrain features that do not provide suitable
28 habitat for sage-grouse will be removed from the HEA model. All vegetation types and
29 landforms that potentially provide habitat for sage-grouse will remain in the model.

30 **VAR01 and VAR02 Distance to Roads and Highways or Other Infrastructure**

31 Road layers used in developing the baseline HEA model are available from the Bureau of
32 Land Management, U.S. Forest Service, state agencies, or from readily available standard
33 road and infrastructure layers. Road layers will be compared between states to ensure
34 consistency in classification prior to using them in the HEA model development. HEA model
35 scores will be applied to 30-m raster cells according to the process described in Table A1,
36 Appendix A. For example, all cells that are more than 1,000 m from interstate highways or
37 high traffic volume state and federal highways will be given a score of 3, those between 650
38 and 1,000 m will be given a score of 2, those between 100 and 650 m will be given a score of

1, and those cells within 100 m will be removed from consideration in the model per the description provided for Variable 4 in Table A1 and the supporting text.

VAR03 Distance to Fences that Pose a High Risk for Collision

Grazing allotment boundaries will be used as surrogates for fence locations in the HEA baseline model development, because fence data of equal quality is not available across the entire assessment area. Modeling of fences will only occur where data are available, which may exclude private lands and federal lands that do not have allotments defined. The model of Stevens et al. (in press) will be used to identify fences that pose a high collision risk for sage-grouse. Scores for distance to high-risk fence will be applied to the 30-m grid cells in the model in the same manner as described for roads and highways with cells closest to fences receiving the lowest scores and those farthest from fences receiving the highest scores.

VAR04 Slope

Slope will be calculated using 30-m digital elevation models and scored according to the process described in Appendix A.

VAR05 Distance to Lek (10-year Average Count >0 Males)

Lek data will be obtained from the wildlife management agencies in each state. Lek status will be determined for all leks. Leks that have been active in the past 10 years or that have an unknown status will be included in the HEA model. Those that are labeled as unoccupied or inactive will not be included. Cells surrounding leks will be scored according to the methods described in Appendix A with cells closest to leks receiving the highest scores.

VAR06 Sagebrush Abundance Index

A sagebrush abundance index will be determined from available vegetation layers by calculating the proportion of sagebrush in a 1-square-kilometer area surrounding each 30-m cell in the assessment area. Scores will be applied using the methods described in Appendix A. Areas with a high proportion of sagebrush in the landscape and some habitat heterogeneity will be scored higher than areas with little habitat heterogeneity or areas with little or no sagebrush.

Sagebrush Cover, Sagebrush Canopy Height

When possible, percent cover and height will be determined directly from the vegetation attribute data included in the GAP and Landfire vegetation datasets. Where data are not available, attributes for percent cover and height will be determined using other data sources. Sampling data from GAP/Landfire datasets as well as datasets obtained from BLM and the state agencies will be used to attribute vegetation percent cover and height for segments of the landscape with the most similar characteristics. Once vegetation values have been applied to the 30-m grid, HEA scores will be applied using the methods described in Appendix A.

Distance to Vegetation Dominated by Sagebrush or Shrub

The distance from each cell to the nearest sagebrush- or shrub-dominated cell will be calculated. Cells within or closest to sagebrush or shrub landscapes will be scored higher than those that are distant from shrub-dominated cells.

SUMMATION OF BASELINE SERVICES IN THE HEA MODEL

Spatial grids representing the above HEA variables will be combined through additive raster calculations to create a final raster layer. The value of each cell will be the sum of variables 1 through 9. The final numeric value for each cell is the habitat services provided to sage-grouse by that cell.

The resulting habitat service values and the number of acres associated with each of the habitat service values will be multiplied together and summed across the Assessment Area to calculate the total habitat services (expressed in service acres) (Equation 1). The total habitat services provided by the Assessment Area will be calculated and will serve as the pre-construction baseline for the Project.

Equation 1.
$$VJ = \sum_1^i (V_i * J_{V_i})$$

where:

VJ is the habitat services (service-acres) provided by the Assessment Area,

V is the habitat service score (i.e., the sum of the variable scores in the habitat service metric),

i is the number of possible unique values for V , and

J_{V_i} is the number of acres for each value of V_i , where $\sum_1^i J_{V_i}$ would equal the total acreage of the Assessment Area (J).

APPENDIX C

Quantification of Habitat Service Losses

QUANTIFICATION OF HABITAT SERVICE LOSSES

Habitat service losses caused by the Project will be modeled using geographic information system (GIS) technology for important Project milestones by decreasing the variable scores below the Baseline level for the Project effects identified for that milestone using habitat services metric in the footprint of the Project (direct disturbances) and in buffers around the footprint (indirect disturbances). The habitat service scores for each milestone will be summed across the Assessment Area to calculate the estimated interim and permanent habitat service losses associated with the Project.

DESCRIPTION OF DISTURBANCES BY PROJECT MILESTONE

The habitat services provided by the Assessment Area will be measured at several different Project milestones that reflect varying levels of disturbance.

The Project milestones modeled for the HEA will be:

1. **Baseline**—the baseline milestone quantifies habitat services available to greater sage-grouse (*Centrocercus urophasianus*) (sage-grouse) before disturbance. The calculation of the habitat services available to sage-grouse at Baseline is described in Appendix B.
2. **Construction**—the transmission line construction milestone quantifies habitat services available to sage-grouse during the construction of the Project.
3. **Restoration**—the restoration milestone quantifies habitat services available to sage-grouse after Project construction is complete and some services return with the reduction in noise and human presence.
4. **Recovery**—the recovery milestone quantifies habitat services available to sage-grouse after a vegetation type has recovered to the greatest extent expected after Project restoration is complete. Habitat services return to baseline conditions in restored areas with the time to recovery being dependent on the vegetation type. It is anticipated that there will be multiple vegetation-based recovery endpoints. Vegetation recovery endpoints will be determined upon identification of the vegetation communities impacted by the Project.

QUANTIFYING LOSS OF HABITAT SERVICES DUE TO SURFACE DISTURBANCE DURING CONSTRUCTION

For the Construction milestone, direct disturbances will be defined as the loss of habitat services associated with vegetation removal and ground-disturbing activities within the construction footprint (Table C1). The habitat service scores for all 30-square-meter raster cells in the Project footprint where vegetation removal or ground disturbance occur will be changed from the Baseline service scores to 0 in the GIS model for this milestone. Recovery from the disturbed state will be applied per the vegetation-specific recovery curves for the Project.

Table C1. Direct Disturbance Levels Modeled by Project Milestone and Disturbance Type

Project Milestones	Percent Baseline Services Present by Direct Disturbance Type		
	Series Compensation Stations	Transmission Towers	Access Roads, Transmission Lines, and Temporary Infrastructure
Baseline	100%	100%	100%
Construction	0%	0%	0%
Restoration	0%	0%	0%
Progressive Vegetation Recovery	0%	0% within permanent tower footprint. Elsewhere baseline services will be retuned per the vegetation-specific recovery curves developed for the Project.*	Baseline services will be retuned per the vegetation-specific recovery curves developed for the Project.

* Baseline habitat services will return in the model in areas where two-track roads will be maintained for occasional access by PacifiCorp personnel. Two-track roads were not identified in metric as changing the habitat services available for sage-grouse, and so these roads have no effect in the model once construction is complete.

QUANTIFYING LOSS OF HABITAT SERVICES DUE TO INDIRECT DISTURBANCES DURING CONSTRUCTION

Indirect disturbances will be simulated by applying buffers to the construction footprint and decreasing the habitat service scores below the Baseline habitat service scores within the buffers. Because of uncertainties in the indirect impacts of transmission structures on sage-grouse, at this time, noise and human presence will be the only indirect disturbances modeled in the HEA.

Use of construction equipment such as backhoes, cranes, front-end loaders, bulldozers, graders, excavators, compressors, generators, and various trucks would be needed for mobilizing crew, transportation and use of materials, line work, site clearing, and preparation during the construction phase of the Project. Construction of and improvements to access roads would require use of earthmoving equipment such as bulldozers and graders. Table C2 provides the typical noise levels for the construction equipment that could potentially be used during the construction phase of the Project (ranging 80 to 90 A-weighted decibels [dBA] at 50 feet [15 meters (m)] from any work site).¹

¹ Construction noise values taken from Energy Gateway West HEA report.

Table C2. Typical Noise Levels from Construction Equipment

Equipment Type	Noise Level at 50 feet (dBA)
Crane	88
Backhoe	85
Pan loader	87
Bulldozer	89
Fuel truck	88
Water truck	88
Grader	85
Roller	80
Mechanic truck	88
Flat bed truck	88
Dump truck	88
Tractor	80
Concrete truck	86
Concrete pump	82
Front end loader	83
Scraper	87
Air compressor	82
Average construction site	85

Noise during the construction phase of the Project would be similar in magnitude to noise produced by vehicles using secondary roads (county highways, state highways, and heavily travelled gravel roads such as access roads for oil and gas development, mining, etc.). Passenger vehicles, medium trucks, and heavy trucks travelling 55 miles per hour (mph) produce typical noise levels of 72 to 74 dBA, 80 to 82 dBA, and 84 to 86 dBA, respectively, from a distance of 50 feet. Therefore, the noise disturbance associated with construction will be modeled as if the construction area was a secondary road (Table C3).

In the model, buffers will be placed around active construction areas in a manner that is identical to the methods used for secondary roads. The cells that fall within these buffers will be scored in a manner identical to a secondary road (that is, the score for VAR02 decreased).

Table C3. Indirect Disturbance Levels Modeled by Project Year and Disturbance Type

Project Milestones	Indirect Disturbance Buffers Applied by Disturbance Type		
	Series Compensation Stations	Transmission Towers	Access Roads, Transmission Lines, and Temporary Infrastructure
Baseline	None	None	None
Construction	Secondary road	Secondary road	Secondary road
Restoration	Secondary road	None	None
Progressive Vegetation Recovery	Secondary road	None	None
	Secondary road	None	None
	Secondary road	None	None
	Secondary road	None	None

QUANTIFYING HABITAT SERVICES LOSSES DURING RESTORATION AND RECOVERY

Project-related habitat service losses are anticipated to decrease once construction is complete. Although still below baseline levels, the habitat service scores rise during restoration and recovery with vegetation regrowth (direct disturbances) and decreased levels of noise and human presence (indirect disturbances).

Restoration Milestone

For the Restoration milestone, direct disturbances will be defined as the loss of all habitat services in the construction footprint where vegetation clearing and ground disturbance occurs because the vegetation has not regrown sufficiently to provide habitat (see Table C1).

The indirect disturbance buffers that are applied to the series compensation stations during construction will remain during the restoration milestone and for the life of the Project because of the noise and human activity associated with operation of these facilities. No indirect disturbances will be modeled for the rest of the Project because little vehicle traffic or human presence is anticipated in these areas after construction of the line is complete.

Progressive Recovery Milestone

For the Recovery milestone, direct disturbances will be defined as the loss of all habitat services in the footprint of the transmission structure pads and the partial loss of services in areas of vegetation regrowth (see Table C1). Indirect disturbances will be applied in a manner identical to the Construction milestone (see Table C3).

Habitat services in areas where the vegetation is reclaimed (i.e., outside the footprint of permanent facilities) will gradually return to baseline conditions at a rate dependent on the vegetation type. Services will return more rapidly for vegetation having rapid recovery rates

(e.g., agriculture, grassland, wetland, or riparian) than for those with slower recovery times (e.g., shrub-dominated including sagebrush). Vegetation recovery curves will be developed for the vegetation communities that are impacted by Project activities.

To calculate the progressive return of services, the percentage of the baseline service value for a cell will be calculated based on the appropriate vegetation recovery curve. For example, in those vegetation types with rapid restoration potential (agricultural areas, some grasslands, etc.), habitat services could be returned to 100% of Baseline in the first year following construction. Those with longer recovery times may only achieve partial service returns per year until achieving their maximum value. For example, a vegetation community with a 50-year recovery period might achieve 10% value in year 5 after restoration, 20% in year 10, 30% in year 15, etc., until all services are returned in year 50.

HEA TO QUANTIFY INTERIM AND PERMANENT HABITAT INJURIES

The approach described above will produce a measure of habitat services (in service-acres) for each of the Project milestones for each of the modeled Project segments. The HEA is a stepwise model which quantifies the habitat injury separately in each year (Figure C1) and each of the milestones will be assigned to a calendar year per the schedule provided by the Project proponents after the preferred alternative is identified. It is likely that a linear change in habitat services will be used to estimate annual service-acre increases between restoration and recovery and between the vegetation-specific recovery times. The total number of service-acres lost per year will be summed across the analysis period and expressed as service-acre-years. This value is the estimated sum of the interim and permanent losses to sage-grouse habitat that would occur as a result of project construction and operation.

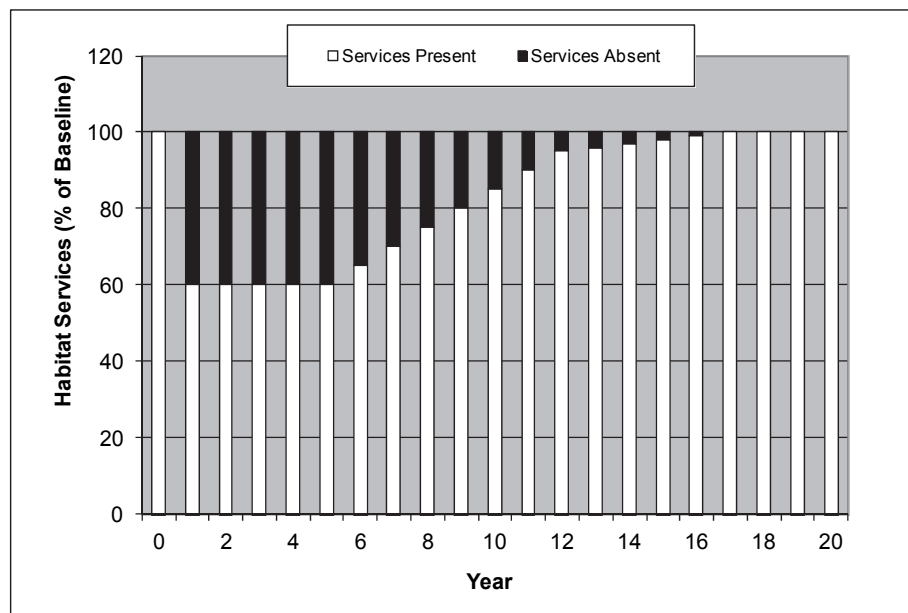


Figure C1. Hypothetical example of how the HEA model considers habitat services absent and habitat services present in each year to calculate the total services lost over the Project period (i.e., sum of the black bars).

The HEA model balances the cumulative injury (I , service-acre-years) over the lifetime of the Project with the cumulative benefit of habitat restoration and mitigation (R , service-acre-years), so that the services returned by habitat restoration and mitigation are greater than or equal to the cumulative injury ($R \geq I$). The habitat injury (I , service-acre-years) will be quantified for the life of the Project using Equation 2. Equation 2 was adapted from Equation 8.1 in Allen et al. (2005)². The discount rate (r) is anticipated to be set to 3%, which is standard for this type of analysis. The discount rate converts services being provided in different time periods into current time period equivalents (Allen et al. 2005). The discount rate effectively weighs the habitat service losses so that losses occurring early in the project result in a greater overall injury than losses occurring later in the project. Likewise, habitat restoration and mitigation occurring early in the Project would result in a greater benefit than habitat restoration and mitigation occurring late in the Project.

Equation 2.
$$I = \sum_{t=0}^y JV^j * \rho_t * [(b^j - x_t^j) / b^j]$$

where:

I is the present value of the service-acre-years lost over y due to interim and permanent injury,

$t = 0$ is the year the project begins,

y is the analysis period (107 years),

JV^j is the value of the habitat services provided by the injured habitat (service-acres) before injury (i.e., at the Baseline milestone),

b^j is the mean service score provided by the Assessment Area (JV^j/J , where J is the injury Assessment Area in acres) at the Baseline milestone (time $[t] = 0$),

ρ_t is the discount factor, where $\rho_t = 1/(1+r)^{t-C}$, where r is the discount rate for the time period and C is the time the claim is presented ($C = \text{Project Year 1}$), and

x_t^j is the mean service score provided by the Assessment Area at the end of year t if Project disturbances are applied.

² Allen, P.D. II, D.J. Chapman, and D. Lane. 2005. Scaling environmental restoration to offset injury using habitat equivalency analysis. In *Economics and Ecological Risk Assessment: Applications to Watershed Management*, edited by R.F. Bruins and M.T. Heberling, pp. 165–184. Boca Raton, Florida: CRC Press.

APPENDIX D

Quantification of Habitat Service Gains Produced by Habitat Restoration and Mitigation projects

Appendix D. Quantification of Habitat Service Gains Produced by Habitat Restoration and Mitigation projects

MODELING MITIGATION PROJECT HABITAT SERVICE GAINS

Habitat restoration and mitigation projects are intended to create new, or protect existing, greater sage-grouse (*Centrocercus urophasianus*) (sage-grouse) habitat services (Table D1). These measures serve as a “toolbox” from which mitigation options may be selected by PacifiCorp for inclusion in a mitigation package once the Bureau of Land Management has identified the preferred alternative for Gateway South and final Habitat Equivalency Analysis (HEA) results are available for that alternative. The purpose of implementing the habitat restoration and mitigation projects is to offset the cumulative sage-grouse habitat service losses in the Assessment Area over the Project lifetime (see *I* in Equation 2 from Appendix C). The HEA will be used to evaluate the benefit of a sample of conservation projects in the Assessment Area.

Table D1. Potential Habitat Restoration and Mitigation projects for Inclusion in the HEA

Measure	Brief Project Description	Anticipated Benefits
Fence removal and marking with flight diverters	Fence segments that pose a high collision risk for sage-grouse (Stevens et al., in press*) would be marked, modified, or removed to reduce or remove threats to sage-grouse.	• Reduce mortality due to sage-grouse collisions • Increase visibility of fences • Increase contiguous patches of shrub-steppe habitat • Remove localized grazing pressure and increase habitat
Sagebrush restoration and improvement projects	Seeding, planting seedlings, or transplanting containerized sagebrush plants (one plant per 5 square meters) and seeding a bunchgrass understory.	• Create contiguous patches of shrub-steppe habitat with optimal sagebrush cover and height and a bunchgrass understory • Increase availability of high-quality nesting, brood rearing, and winter habitats
Juniper/conifer removal	Mechanical removal (lop and scatter, cut-pile-cover, or mastication) of juniper/conifer adjacent to areas with optimal sagebrush cover and height.	• Reverse juniper/conifer encroachment on shrub-steppe habitat to increase contiguous patches of sage-grouse habitat • Increase light penetration to support a forb and grass understory
Conservation easements	Removes threat of specific land uses to sensitive wildlife populations.	• Prevent sage-grouse habitat destruction or degradation near urban areas and oil and gas development • Reduce future fragmentation of shrub-steppe habitat

* Stevens, B.S., D.E. Naugle, B. Dennis, J.W. Connelly, T. Griffiths, and K.P. Reese. In press. Mapping sage-grouse fence-collision risk: Spatially-explicit models to target conservation implementation. Wildlife Society Bulletin.

GIS MODELING OF CONSERVATION BENEFITS

The analysis of habitat service benefits produced by each habitat restoration or mitigation measure in Table D1 will be completed using an approach similar to that described for quantifying habitat losses. It is necessary that both analyses—quantification of habitat service

Appendix D. Quantification of Habitat Service Gains Produced by Habitat Restoration and Mitigation projects

losses and habitat service gains—use the same habitat services metric (see Appendix A), the same unit of measure (service-acres and service-acre-years), the same analysis period, and the same discount rate. Figure D1 illustrates a hypothetical example of how mitigation would be added to the baseline service metric over time to derive an estimate of the service-acre-years provided by the mitigation projects that will be modeled for the Project.

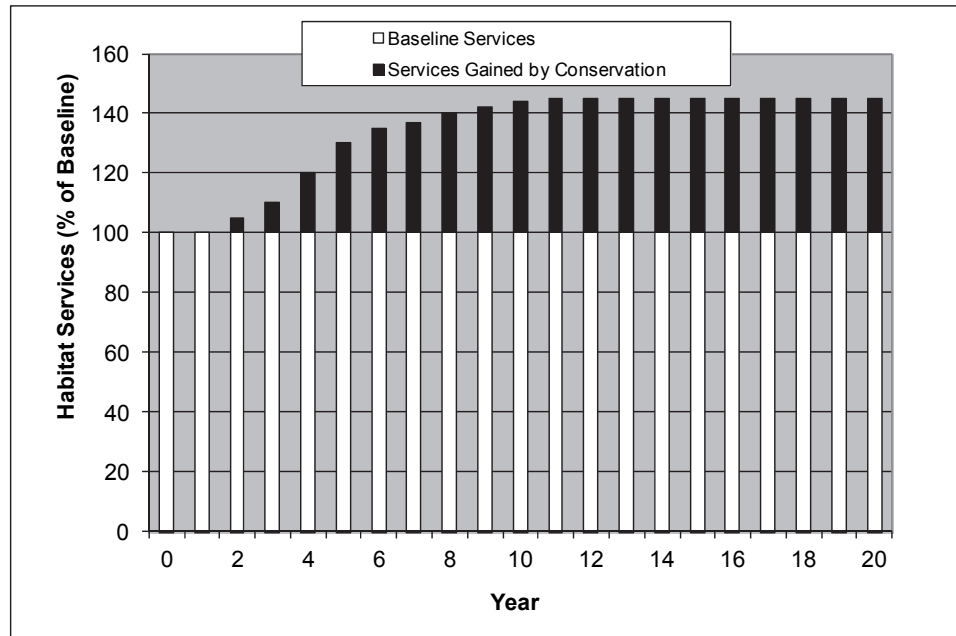


Figure D1. Hypothetical example of how the HEA model considers habitat services gained by habitat restoration and mitigation to calculate the total services gained over the project period (i.e., sum of the black bars).

Modeling Habitat Restoration and Mitigation projects

Ideally, locations of possible habitat restoration and mitigation projects will be identified prior to finalization of the HEA process. In the event that these locations are not known, hypothetical habitat restoration and mitigation project areas will be used to estimate average habitat service gain.

Once actual or hypothetical habitat restoration and mitigation project locations are identified, variable scores in the HEA model will be changed to approximate the change in habitat services expected with implementation of the measure. The new habitat service score will be calculated for each cell in the Assessment Area using the same habitat services metric used to quantify baseline and impacts (see Appendix A). The habitat service benefit of a modeled project will be calculated by determining the difference in the habitat services provided at baseline and after implementation of the habitat restoration or mitigation measure.

For each habitat restoration/mitigation project, the time to full benefit and project initiation timing will be determined and accounted for in the HEA model to estimate of the present value habitat service gain that would be created. The present value habitat service gain (R ,

Appendix D. Quantification of Habitat Service Gains Produced by
Habitat Restoration and Mitigation projects

service-acre-years) will be quantified for the life of the Project using Equation 3 (adapted from Equation 8.1 in Allen et al. 2005¹).

Equation 3.
$$R = \sum_{t=0}^y PV^p * \rho_t * [(x_t^p - b^p) / b^p]$$

where:

R is the present value of the service-acre-years gained by the habitat restoration or mitigation measure,

$t = 0$ is the year the transmission line Project begins,

y is the analysis period (107 years),

PV^p is the value of the habitat services provided by the improved habitat (service-acres) before habitat restoration or mitigation measure (i.e., at the Baseline milestone),

b^p is the mean service score provided by the Assessment Area (PV^p/P , where P is the injury Assessment Area in acres) at the Baseline milestone (time $[t] = 0$),

ρ_t is the discount factor, where $\rho_t = 1/(1+r)^{t-C}$, where r is the discount rate for the time period and C is the time the claim is presented ($C = \text{Project Year 1}$), and

x_t^p is the mean service score provided by the Assessment Area at the end of year t if habitat restoration or mitigation measure benefits are applied.

The present value habitat service gain (R) will be standardized among projects by dividing by size of project (units in acres or linear miles depending on the conservation measure modeled) and averaged among hypothetical projects applying the same conservation measure to produce the service-years gained per unit of treatment ($\bar{R}^m$). This value will be used in mitigation calculations.

ESTIMATING COST TO IMPLEMENT MODELED HABITAT RESTORATION AND MITIGATION PROJECTS

The cost of the modeled habitat restoration and mitigation projects will be estimated by averaging the known cost of similar projects previously implemented (in current year U.S. dollars). The cost per unit treated will be divided by the average service-acre-years per unit area treated (calculated in the previous section), to estimate the price per service-acre-year gained for each of the habitat restoration and mitigation projects. This is the currency that will be used to offset the permanent and interim habitat service losses associated with Project construction and operation for the duration of the analysis.

¹ Allen, P.D. II, D.J. Chapman, and D. Lane. 2005. Scaling environmental restoration to offset injury using habitat equivalency analysis. In *Economics and Ecological Risk Assessment: Applications to Watershed Management*, edited by R.F. Bruins and M.T. Heberling, pp. 165–184. Boca Raton, Florida: CRC Press.

Appendix D. Quantification of Habitat Service Gains Produced by
Habitat Restoration and Mitigation projects

APPROACH TO OFFSET HABITAT SERVICE LOSSES WITH HABITAT SERVICE GAINS

An HEA scales the mitigation package (i.e., funding to create habitat services) to offset the loss of habitat services over the lifetime of the project. The injury is offset by planned habitat restoration and mitigation projects in Equation 4, where the project size (P^m) can be solved for each habitat restoration or mitigation measure type (m).

Equation 4

$$I = \sum_{m=1}^i P^m * \bar{R}^m$$

where:

I is the present value of the service-acre-years lost over y due to interim and permanent injury,

y is the analysis period (107 years)

i is the number of habitat restoration and mitigation projects modeled,

P^m is the size of the habitat restoration or mitigation project of type m (in units of acres or miles), and

$\bar{R}^m$ is mean service-years gained per unit (acres or miles) of treatment.

Once the P^m is defined for each habitat improvement and mitigation measure, the costs per unit can be applied. Mitigation due is the sum of the costs to implement each of the habitat improvement and mitigation projects needed to offset the Project.

APPENDIX G – GRAZING ALLOTMENT SUPPORTING DATA

Introduction

Tables G-1, G-2, and G-3 are lists of the grazing allotments crossed by each alternative route for each state. This information supports the land use resource inventories and impact assessment. The inventories and analysis are included in the Draft Environmental Impact Statement and Land-use Plan Amendments for the Energy Gateway South Transmission Project Section 3.2.10.

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Alternative WYCO-B (Applicant Preferred Alternative)						
Chace Block	BLM Rawlins Field Office	67,290	4.5	52	22	0.0
Continental	BLM Rawlins Field Office	24,926	5.3	60	26	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	19	0.0
Dana Block North	BLM Rawlins Field Office	70,878	16.6	191	81	0.0
East Muddy	BLM Rawlins Field Office	25,034	3.6	42	18	0.0
Echo Springs	BLM Rawlins Field Office	37,788	5.8	67	29	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	6	2	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	3.6	42	18	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	53	23	0.0
Not named	BLM Rawlins Field Office	442,935	18.4	211	90	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	9.2	105	45	0.0
Powder Rim Rotati	BLM Rawlins Field Office	46,706	8.2	95	40	0.0
Quealey Block	BLM Rawlins Field Office	23,782	1.5	18	8	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	131	56	0.0
Rotten Springs	BLM Rawlins Field Office	21,024	0.7	8	4	0.0
Sand Creek	BLM Rawlins Field Office	29,920	7.3	84	36	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	125	53	0.0
South Barrel	BLM Rawlins Field Office	10,268	3.2	37	16	0.0
South Laclede	BLM Rawlins Field Office	53,035	11.4	131	56	0.0
South Wamsutter	BLM Rawlins Field Office	32,817	7.1	82	35	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	7.7	88	38	0.0
East Powder Wash	BLM Little Snake Field Office	27,154	3.8	44	19	0.0
Grounds	BLM Little Snake Field Office	8,012	2.1	24	10	0.0
Horse Draw	BLM Little Snake Field Office	7,414	1.8	21	9	0.0
Nipple Peak	BLM Little Snake Field Office	15,560	5.3	61	26	0.0
Powder Wash	BLM Little Snake Field Office	27,432	1.8	21	9	0.0
Sand Wash	BLM Little Snake Field Office	76,108	2.4	28	12	0.0
Sheepherder Spring	BLM Little Snake Field Office	86,354	4.7	53	23	0.0
Snake River	BLM Little Snake Field Office	62,469	11.3	130	56	0.0
West Wapiti Peak	BLM Little Snake Field Office	10,411	3.6	42	18	0.0
Elk Springs	BLM White River Field Office	26,620	8.0	92	39	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	32	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,651,911	198.5	2,283	973	0.0
20515	Wyoming State Lands	160	0.3	3	1	0.0
30742	Wyoming State Lands	639	1.0	11	5	0.0
36220	Wyoming State Lands	799	0.6	7	3	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	12	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	0.0	0	0	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
John A. Maneotis	Colorado State Land Board	5,125	3.1	35	15	0.0
Nottingham Land & Livestock	Colorado State Land Board	8,885	4.2	48	20	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
Visintainer Sheep Company	Colorado State Land Board	3,259	1.0	12	5	0.0
State Total		26,967	14.8	170	72	0.0
Grand Total		1,661,948	201.6	2,318	988	0.0
Route Variation WYCO-B-1						
Chace Block	BLM Rawlins Field Office	67,290	4.5	52	22	0.0
Continental	BLM Rawlins Field Office	24,926	5.3	60	25	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	18	0.0
Dana Block North	BLM Rawlins Field Office	70,878	16.6	191	80	0.0
East Muddy	BLM Rawlins Field Office	25,034	3.6	42	17	0.0
Echo Springs	BLM Rawlins Field Office	37,788	5.8	67	28	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	6	2	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	3.6	42	17	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	53	22	0.0
Not named	BLM Rawlins Field Office	442,935	18.4	211	88	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	9.2	105	44	0.0
Powder Rim Rotati	BLM Rawlins Field Office	46,706	8.2	95	40	0.0
Quealey Block	BLM Rawlins Field Office	23,782	1.5	18	7	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Riner	BLM Rawlins Field Office	59,505	11.4	131	55	0.0
Rotten Springs	BLM Rawlins Field Office	21,024	0.7	8	4	0.0
Sand Creek	BLM Rawlins Field Office	29,920	7.3	84	35	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	125	52	0.0
South Barrel	BLM Rawlins Field Office	10,268	3.2	37	16	0.0
South Laclede	BLM Rawlins Field Office	53,035	11.4	131	55	0.0
South Wamsutter	BLM Rawlins Field Office	32,817	7.1	82	34	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	7.7	88	37	0.0
East Powder Wash	BLM Little Snake Field Office	27,154	3.8	44	18	0.0
Grounds	BLM Little Snake Field Office	8,012	2.1	24	10	0.0
Horse Draw	BLM Little Snake Field Office	7,414	1.8	21	9	0.0
Nipple Peak	BLM Little Snake Field Office	15,560	5.3	61	25	0.0
Powder Wash	BLM Little Snake Field Office	27,432	1.8	21	9	0.0
Sand Wash	BLM Little Snake Field Office	76,108	2.4	28	12	0.0
Shepherd Spring	BLM Little Snake Field Office	86,354	4.7	53	22	0.0
Snake River	BLM Little Snake Field Office	62,469	11.8	135	56	0.0
West Wapiti Peak	BLM Little Snake Field Office	10,411	3.6	42	17	0.0
Elk Springs	BLM White River Field Office	26,620	8.0	92	39	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	31	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,651,911	198.9	2,288	955	0.0
20515	Wyoming State Lands	160	0.3	3	1	0.0
30742	Wyoming State Lands	639	1.0	11	5	0.0
36220	Wyoming State Lands	799	0.6	7	3	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	12	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	0.0	0	0	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
John A. Maneotis	Colorado State Land Board	5,125	3.1	35	15	0.0
Nottingham Land & Livestock	Colorado State Land Board	8,885	4.2	48	20	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
State Total		23,706	13.8	158	66	0.0
Grand Total		1,659,325	202.0	2,323	970	0.0
Route Variation WYCO-B-2 (Agency Preferred Alternative)						
Chace Block	BLM Rawlins Field Office	67,290	4.5	52	22	0.0
Continental	BLM Rawlins Field Office	24,926	5.3	60	25	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	18	0.0
Dana Block North	BLM Rawlins Field Office	70,878	16.6	189	80	0.0
East Muddy	BLM Rawlins Field Office	25,034	3.6	41	17	0.0
Echo Springs	BLM Rawlins Field Office	37,788	5.8	66	28	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	5	2	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	3.6	41	17	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	52	22	0.0
Not named	BLM Rawlins Field Office	442,935	18.4	210	88	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	9.2	105	44	0.0
Powder Rim Rotati	BLM Rawlins Field Office	46,706	8.2	94	40	0.0
Quealey Block	BLM Rawlins Field Office	23,782	1.5	18	7	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	130	55	0.0
Rotten Springs	BLM Rawlins Field Office	21,024	0.7	8	4	0.0
Sand Creek	BLM Rawlins Field Office	29,920	7.3	84	35	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	124	52	0.0
South Barrel	BLM Rawlins Field Office	10,268	3.2	37	16	0.0
South Laclede	BLM Rawlins Field Office	53,035	11.4	130	55	0.0
South Wamsutter	BLM Rawlins Field Office	32,817	7.1	81	34	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	7.1	81	34	0.0
Disappointment	BLM Little Snake Field Office	32,302	3.6	41	17	0.0
East Powder Wash	BLM Little Snake Field Office	27,154	3.8	44	18	0.0
Grounds	BLM Little Snake Field Office	8,012	2.1	24	10	0.0
Horse Draw	BLM Little Snake Field Office	7,414	1.8	21	9	0.0
Nipple Peak	BLM Little Snake Field Office	15,560	5.3	60	25	0.0
Powder Wash	BLM Little Snake Field Office	27,432	1.8	20	9	0.0
Sand Wash	BLM Little Snake Field Office	76,108	2.4	28	12	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Shepherd Spring	BLM Little Snake Field Office	86,354	4.7	53	22	0.0
Snake River	BLM Little Snake Field Office	62,469	11.3	129	54	0.0
Elk Springs	BLM White River Field Office	26,620	8.3	95	40	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	31	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,673,802	198.2	2,259	951	0.0
20515	Wyoming State Lands	160	0.3	3	1	0.0
30742	Wyoming State Lands	639	1.0	11	5	0.0
36220	Wyoming State Lands	799	0.6	7	3	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	11	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	0.0	0	0	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
John A. Maneotis	Colorado State Land Board	5,125	3.1	35	15	0.0
Nottingham Land & Livestock	Colorado State Land Board	8,885	4.2	48	20	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
Visintainer Sheep Company	Colorado State Land Board	3,259	1.0	12	5	0.0
State Total		26,967	14.8	168	71	0.0
Grand Total		1,683,199	201.2	2,294	966	0.0
Route Variation WYCO-B-3						
Chace Block	BLM Rawlins Field Office	67,290	4.5	52	22	0.0
Continental	BLM Rawlins Field Office	24,926	5.3	60	26	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	19	0.0
Dana Block North	BLM Rawlins Field Office	70,878	16.6	191	81	0.0
East Muddy	BLM Rawlins Field Office	25,034	3.6	42	18	0.0
Echo Springs	BLM Rawlins Field Office	37,788	5.8	67	29	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	6	2	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	3.6	42	18	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	53	23	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Not named	BLM Rawlins Field Office	442,935	18.4	211	90	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	9.2	105	45	0.0
Powder Rim Rotati	BLM Rawlins Field Office	46,706	8.2	95	40	0.0
Quealey Block	BLM Rawlins Field Office	23,782	1.5	18	8	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	131	56	0.0
Rotten Springs	BLM Rawlins Field Office	21,024	0.7	8	4	0.0
Sand Creek	BLM Rawlins Field Office	29,920	7.3	84	36	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	125	53	0.0
South Barrel	BLM Rawlins Field Office	10,268	3.2	37	16	0.0
South Laclede	BLM Rawlins Field Office	53,035	11.4	131	56	0.0
South Wamsutter	BLM Rawlins Field Office	32,817	7.1	82	35	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	7.8	90	38	0.0
East Powder Wash	BLM Little Snake Field Office	27,154	3.8	44	19	0.0
Grounds	BLM Little Snake Field Office	8,012	2.1	24	10	0.0
Horse Draw	BLM Little Snake Field Office	7,414	1.8	21	9	0.0
Nipple Peak	BLM Little Snake Field Office	15,560	5.3	61	26	0.0
Powder Wash	BLM Little Snake Field Office	27,432	1.8	21	9	0.0
Sand Wash	BLM Little Snake Field Office	76,108	2.4	28	12	0.0
Sheepherder Spring	BLM Little Snake Field Office	86,354	4.7	53	23	0.0
Snake River	BLM Little Snake Field Office	62,469	11.3	130	56	0.0
West Wapiti Peak	BLM Little Snake Field Office	10,411	3.4	39	16	0.0
Elk Springs	BLM White River Field Office	26,620	8.2	94	40	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	32	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,651,911	198.5	2,283	973	0.0
20515	Wyoming State Lands	160	0.3	3	1	0.0
30742	Wyoming State Lands	639	1.0	11	5	0.0
36220	Wyoming State Lands	799	0.6	7	3	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	12	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	0.0	0	0	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
John A. Maneotis	Colorado State Land Board	5,125	3.1	35	15	0.0
Nottingham Land & Livestock	Colorado State Land Board	8,885	4.2	48	20	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
Visintainer Sheep Company	Colorado State Land Board	3,259	1.0	12	5	0.0
State Total		26,967	14.8	170	72	0.0
Grand Total		1,661,948	201.6	2,318	988	0.0
Alternative WYCO-C						
Chace Block	BLM Rawlins Field Office	67,290	4.5	52	21	0.0
Continental	BLM Rawlins Field Office	24,926	0.8	9	4	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	18	0.0
Dana Block North	BLM Rawlins Field Office	70,878	16.6	191	78	0.0
Echo Springs	BLM Rawlins Field Office	37,788	5.8	67	27	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	6	2	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	3.6	42	17	0.0
North Barrel	BLM Rawlins Field Office	58,924	3.1	35	14	0.0
North Laclede	BLM Rawlins Field Office	41,848	10.5	121	49	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	53	22	0.0
Not named	BLM Rawlins Field Office	442,935	18.4	211	86	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	9.2	105	43	0.0
Powder Rim Rotati	BLM Rawlins Field Office	46,706	7.0	81	33	0.0
Quealey Block	BLM Rawlins Field Office	23,782	1.5	18	7	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	131	54	0.0
Rotten Springs	BLM Rawlins Field Office	21,024	2.7	31	13	0.0
Sand Creek	BLM Rawlins Field Office	29,920	4.2	48	20	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	125	51	0.0
South Laclede	BLM Rawlins Field Office	53,035	9.4	109	44	0.0
South Wamsutter	BLM Rawlins Field Office	32,817	6.3	73	30	0.0
Willow Creek	BLM Rawlins Field Office	76,258	8.9	103	42	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	7.7	88	36	0.0
East Powder Wash	BLM Little Snake Field Office	27,154	3.8	44	18	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Grounds	BLM Little Snake Field Office	8,012	2.1	24	10	0.0
Horse Draw	BLM Little Snake Field Office	7,414	1.8	21	8	0.0
Nipple Peak	BLM Little Snake Field Office	15,560	5.3	61	25	0.0
Powder Wash	BLM Little Snake Field Office	27,432	1.8	21	8	0.0
Sand Wash	BLM Little Snake Field Office	76,108	2.4	28	11	0.0
Shepherd Spring	BLM Little Snake Field Office	86,354	4.7	53	22	0.0
Snake River	BLM Little Snake Field Office	62,469	11.3	130	53	0.0
West Wapiti Peak	BLM Little Snake Field Office	10,411	3.6	42	17	0.0
Elk Springs	BLM White River Field Office	26,620	8.0	92	38	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	31	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,793,637	204.5	2,351	961	0.0
30742	Wyoming State Lands	639	1.0	11	5	0.0
36220	Wyoming State Lands	799	0.6	7	3	0.0
41351	Wyoming State Lands	635	0.5	6	2	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	12	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	0.0	0	0	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
John A. Maneotis	Colorado State Land Board	5,125	3.1	35	14	0.0
Nottingham Land & Livestock	Colorado State Land Board	8,885	4.2	48	20	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
Visintainer Sheep Company	Colorado State Land Board	3,259	1.0	12	5	0.0
State Total		27,442	15.0	172	70	0.0
Grand Total		1,803,674	207.5	2,386	975	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Route Variation WYCO-C-1						
Chace Block	BLM Rawlins Field Office	67,290	4.5	52	21	0.0
Continental	BLM Rawlins Field Office	24,926	0.8	9	4	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	18	0.0
Dana Block North	BLM Rawlins Field Office	70,878	16.6	191	78	0.0
Echo Springs	BLM Rawlins Field Office	37,788	5.8	67	27	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	6	2	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	3.6	42	17	0.0
North Barrel	BLM Rawlins Field Office	58,924	3.1	35	14	0.0
North Laclede	BLM Rawlins Field Office	41,848	10.5	121	49	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	53	22	0.0
Not named	BLM Rawlins Field Office	442,935	18.4	211	86	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	9.2	105	43	0.0
Powder Rim Rotati	BLM Rawlins Field Office	46,706	7.0	81	33	0.0
Quealey Block	BLM Rawlins Field Office	23,782	1.5	18	7	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	131	54	0.0
Rotten Springs	BLM Rawlins Field Office	21,024	2.7	31	13	0.0
Sand Creek	BLM Rawlins Field Office	29,920	4.2	48	20	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	125	51	0.0
South Laclede	BLM Rawlins Field Office	53,035	9.4	109	44	0.0
South Wamsutter	BLM Rawlins Field Office	32,817	6.3	73	30	0.0
Willow Creek	BLM Rawlins Field Office	76,258	8.9	103	42	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	7.7	88	36	0.0
East Powder Wash	BLM Little Snake Field Office	27,154	3.8	44	18	0.0
Grounds	BLM Little Snake Field Office	8,012	2.1	24	10	0.0
Horse Draw	BLM Little Snake Field Office	7,414	1.8	21	8	0.0
Nipple Peak	BLM Little Snake Field Office	15,560	5.3	61	25	0.0
Powder Wash	BLM Little Snake Field Office	27,432	1.8	21	8	0.0
Sand Wash	BLM Little Snake Field Office	76,108	2.4	28	11	0.0
Sheepherder Spring	BLM Little Snake Field Office	86,354	4.7	53	22	0.0
Snake River	BLM Little Snake Field Office	62,469	11.8	135	55	0.0
West Wapiti Peak	BLM Little Snake Field Office	10,411	3.6	42	17	0.0
Elk Springs	BLM White River Field Office	26,620	8.0	92	38	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Horse Draw	BLM White River Field Office	17,761	6.6	75	31	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,793,637	204.9	2,356	963	0.0
30742	Wyoming State Lands	639	1.0	11	5	0.0
36220	Wyoming State Lands	799	0.4	4	2	0.0
36220	Wyoming State Lands	799	0.3	3	1	0.0
41351	Wyoming State Lands	635	0.5	6	2	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	12	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	0.0	0	0	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
John A. Maneotis	Colorado State Land Board	5,125	3.1	35	14	0.0
Nottingham Land & Livestock	Colorado State Land Board	8,885	4.2	48	20	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
State Total		24,181	14.0	161	66	0.0
Grand Total		1,801,051	208.0	2,392	978	0.0
Route Variation WYCO-C-2						
Chace Block	BLM Rawlins Field Office	67,290	4.5	52	21	0.0
Continental	BLM Rawlins Field Office	24,926	0.8	9	4	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	18	0.0
Dana Block North	BLM Rawlins Field Office	70,878	16.6	189	78	0.0
Echo Springs	BLM Rawlins Field Office	37,788	5.8	66	27	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	5	2	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	3.6	41	17	0.0
North Barrel	BLM Rawlins Field Office	58,924	3.1	35	14	0.0
North Laclede	BLM Rawlins Field Office	41,848	10.5	120	49	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	52	22	0.0
Not named	BLM Rawlins Field Office	442,935	18.4	210	86	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	9.2	105	43	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Powder Rim Rotati	BLM Rawlins Field Office	46,706	7.0	80	33	0.0
Quealey Block	BLM Rawlins Field Office	23,782	1.5	18	7	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	130	54	0.0
Rotten Springs	BLM Rawlins Field Office	21,024	2.7	31	13	0.0
Sand Creek	BLM Rawlins Field Office	29,920	4.2	48	20	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	124	51	0.0
South Laclede	BLM Rawlins Field Office	53,035	9.4	108	44	0.0
South Wamsutter	BLM Rawlins Field Office	32,817	6.3	72	30	0.0
Willow Creek	BLM Rawlins Field Office	76,258	8.9	102	42	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	7.1	81	33	0.0
Disappointment	BLM Little Snake Field Office	32,302	3.6	41	17	0.0
East Powder Wash	BLM Little Snake Field Office	27,154	3.8	44	18	0.0
Grounds	BLM Little Snake Field Office	8,012	2.1	24	10	0.0
Horse Draw	BLM Little Snake Field Office	7,414	1.8	21	8	0.0
Nipple Peak	BLM Little Snake Field Office	15,560	5.3	60	25	0.0
Powder Wash	BLM Little Snake Field Office	27,432	1.8	20	8	0.0
Sand Wash	BLM Little Snake Field Office	76,108	2.4	28	11	0.0
Shepherd Spring	BLM Little Snake Field Office	86,354	4.7	53	22	0.0
Snake River	BLM Little Snake Field Office	62,469	11.3	129	53	0.0
Elk Springs	BLM White River Field Office	26,620	8.3	95	39	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	31	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,815,529	204.1	2,327	959	0.0
30742	Wyoming State Lands	639	1.0	11	5	0.0
36220	Wyoming State Lands	799	0.6	7	3	0.0
41351	Wyoming State Lands	635	0.5	5	2	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	11	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	0.0	0	0	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
John A. Maneotis	Colorado State Land Board	5,125	3.1	35	14	0.0
Nottingham Land & Livestock	Colorado State Land Board	8,885	4.2	48	20	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
Visintainer Sheep Company	Colorado State Land Board	3,259	1.0	12	5	0.0
State Total		27,442	15.0	171	70	0.0
Grand Total		1,824,926	207.2	2,362	974	0.0
Route Variation WYCO-C-3						
Chace Block	BLM Rawlins Field Office	67,290	4.5	52	21	0.0
Continental	BLM Rawlins Field Office	24,926	0.8	9	4	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	18	0.0
Dana Block North	BLM Rawlins Field Office	70,878	16.6	191	78	0.0
Echo Springs	BLM Rawlins Field Office	37,788	5.8	67	27	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	6	2	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	3.6	42	17	0.0
North Barrel	BLM Rawlins Field Office	58,924	3.1	35	14	0.0
North Laclede	BLM Rawlins Field Office	41,848	10.5	121	49	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	53	22	0.0
Not named	BLM Rawlins Field Office	442,935	18.4	211	86	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	9.2	105	43	0.0
Powder Rim Rotati	BLM Rawlins Field Office	46,706	7.0	81	33	0.0
Quealey Block	BLM Rawlins Field Office	23,782	1.5	18	7	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	131	54	0.0
Rotten Springs	BLM Rawlins Field Office	21,024	2.7	31	13	0.0
Sand Creek	BLM Rawlins Field Office	29,920	4.2	48	20	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	125	51	0.0
South Laclede	BLM Rawlins Field Office	53,035	9.4	109	44	0.0
South Wamsutter	BLM Rawlins Field Office	32,817	6.3	73	30	0.0
Willow Creek	BLM Rawlins Field Office	76,258	8.9	103	42	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	7.8	90	37	0.0
East Powder Wash	BLM Little Snake Field Office	27,154	3.8	44	18	0.0
Grounds	BLM Little Snake Field Office	8,012	2.1	24	10	0.0
Horse Draw	BLM Little Snake Field Office	7,414	1.8	21	8	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Nipple Peak	BLM Little Snake Field Office	15,560	5.3	61	25	0.0
Powder Wash	BLM Little Snake Field Office	27,432	1.8	21	8	0.0
Sand Wash	BLM Little Snake Field Office	76,108	2.4	28	11	0.0
Shepherd Spring	BLM Little Snake Field Office	86,354	4.7	53	22	0.0
Snake River	BLM Little Snake Field Office	62,469	11.3	130	53	0.0
West Wapiti Peak	BLM Little Snake Field Office	10,411	3.4	39	16	0.0
Elk Springs	BLM White River Field Office	26,620	8.2	94	38	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	31	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,793,637	204.5	2,352	961	0.0
30742	Wyoming State Lands	639	1.0	11	5	0.0
36220	Wyoming State Lands	799	0.6	7	3	0.0
41351	Wyoming State Lands	635	0.5	6	2	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	12	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	0.0	0	0	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
John A. Maneotis	Colorado State Land Board	5,125	3.1	35	14	0.0
Nottingham Land & Livestock	Colorado State Land Board	8,885	4.2	48	20	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
Visintainer Sheep Company	Colorado State Land Board	3,259	1.0	12	5	0.0
State Total		27,442	15.0	172	70	0.0
Grand Total		1,803,674	207.6	2,387	976	0.0
Alternative WYCO-D						
44 Ranch	BLM Rawlins Field Office	1,625	1.3	14	6	0.0
Baggs Sub Unit	BLM Rawlins Field Office	8,909	0.9	10	4	0.0
Big Robber	BLM Rawlins Field Office	20,463	6.0	68	27	0.0
Chace Block	BLM Rawlins Field Office	67,290	9.7	111	44	0.0
Coal Bank Wash	BLM Rawlins Field Office	7,939	2.1	24	9	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Cottonwood Hill	BLM Rawlins Field Office	16,039	4.7	54	21	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	17	0.0
Dana Block North	BLM Rawlins Field Office	70,878	3.8	44	17	0.0
Dana Meadows South	BLM Rawlins Field Office	38,690	9.5	108	43	0.0
Doty Mountain	BLM Rawlins Field Office	96,139	9.3	105	42	0.0
East Muddy	BLM Rawlins Field Office	25,034	2.2	25	10	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	5	2	0.0
George Dew	BLM Rawlins Field Office	1,540	1.7	19	7	0.0
Headquarters Ranch	BLM Rawlins Field Office	1,193	1.2	14	5	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	6.4	73	29	0.0
Little Robber	BLM Rawlins Field Office	919	1.3	15	6	0.0
Mexican Flats	BLM Rawlins Field Office	16,775	3.7	42	17	0.0
North Pine Butte	BLM Rawlins Field Office	2,763	2.0	22	9	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	52	21	0.0
Not named	BLM Rawlins Field Office	442,935	18.6	212	84	0.0
Oppenheimer	BLM Rawlins Field Office	14,453	2.7	31	12	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	10.2	116	46	0.0
Poison Buttes	BLM Rawlins Field Office	6,381	3.7	43	17	0.0
Riner	BLM Rawlins Field Office	59,505	0.1	2	1	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	130	51	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	124	49	0.0
South Pine Butte	BLM Rawlins Field Office	1,409	1.6	18	7	0.0
V Spreaders	BLM Rawlins Field Office	694	1.2	14	5	0.0
Big Bend	BLM Little Snake Field Office	1,607	1.9	21	8	0.0
Cedar	BLM Little Snake Field Office	7,590	1.9	22	9	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	9.0	102	40	0.0
Chicken Sage	BLM Little Snake Field Office	4,593	2.5	28	11	0.0
Cutoff Gulch	BLM Little Snake Field Office	2,016	0.5	6	2	0.0
Gravel Pit	BLM Little Snake Field Office	1,618	1.6	18	7	0.0
Horse Gulch Sect 15	BLM Little Snake Field Office	37,277	9.6	109	43	0.0
Juniper Mountain	BLM Little Snake Field Office	13,418	2.5	29	11	0.0
Lay Creek	BLM Little Snake Field Office	2,788	1.9	21	8	0.0
Lay Peak Common	BLM Little Snake Field Office	1,680	1.0	11	4	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Little Juniper	BLM Little Snake Field Office	2,657	1.8	20	8	0.0
Lower Fortification	BLM Little Snake Field Office	1,968	1.2	14	6	0.0
N Deception Creek	BLM Little Snake Field Office	13,028	5.3	61	24	0.0
North Pole Gulch	BLM Little Snake Field Office	2,221	1.4	16	6	0.0
State Block Eu	BLM Little Snake Field Office	12,812	6.7	77	30	0.0
West Four Mile	BLM Little Snake Field Office	4,279	2.0	22	9	0.0
West Wapiti Peak	BLM Little Snake Field Office	10,411	3.6	41	16	0.0
Elk Springs	BLM White River Field Office	26,620	8.0	92	36	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	29	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	2	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,406,797	205.4	2,341	924	0.0
17958	Wyoming State Lands	960	0.2	2	1	0.0
25993	Wyoming State Lands	2,637	0.6	6	2	0.0
30742	Wyoming State Lands	639	1.0	11	4	0.0
34394	Wyoming State Lands	200	0.2	2	1	0.0
34759	Wyoming State Lands	320	0.8	10	4	0.0
36220	Wyoming State Lands	799	0.3	3	1	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	11	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	1.0	12	5	0.0
C & C Cattle, LLC	Colorado State Land Board	7,961	4.8	55	22	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
Wilton Earle & Sons	Colorado State Land Board	3,561	2.7	31	12	0.0
Clarence Hannong, Jr.	Colorado State Land Board	317	0.8	10	4	0.0
Clifford T. Henderson	Colorado State Land Board	1,801	2.0	23	9	0.0
John Peroulis & Sons	Colorado State Land Board	8,010	4.2	48	19	0.0
John Raftopoulos	Colorado State Land Board	1,990	1.4	16	6	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
Visintainer Sheep Company	Colorado State Land Board	3,259	2.4	27	11	0.0
State Total		39,639	25.0	285	112	0.0
Grand Total		1,425,227	215.7	2,459	971	0.0
Route Variation WYCO-D-1						
44 Ranch	BLM Rawlins Field Office	1,625	1.3	14	6	0.0
Baggs Sub Unit	BLM Rawlins Field Office	8,909	0.9	10	4	0.0
Big Robber	BLM Rawlins Field Office	20,463	6.0	68	28	0.0
Chace Block	BLM Rawlins Field Office	67,290	9.7	111	45	0.0
Coal Bank Wash	BLM Rawlins Field Office	7,939	2.1	24	10	0.0
Cottonwood Hill	BLM Rawlins Field Office	16,039	4.7	54	22	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	18	0.0
Dana Block North	BLM Rawlins Field Office	70,878	3.8	44	18	0.0
Dana Meadows South	BLM Rawlins Field Office	38,690	9.5	108	44	0.0
Doty Mountain	BLM Rawlins Field Office	96,139	9.3	105	43	0.0
East Muddy	BLM Rawlins Field Office	25,034	2.2	25	10	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	5	2	0.0
George Dew	BLM Rawlins Field Office	1,540	1.7	19	8	0.0
Headquarters Ranch	BLM Rawlins Field Office	1,193	1.2	14	6	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	6.4	73	30	0.0
Little Robber	BLM Rawlins Field Office	919	1.3	15	6	0.0
Mexican Flats	BLM Rawlins Field Office	16,775	3.7	42	17	0.0
North Pine Butte	BLM Rawlins Field Office	2,763	2.0	22	9	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	52	21	0.0
Not named	BLM Rawlins Field Office	442,935	18.6	212	86	0.0
Oppenheimer	BLM Rawlins Field Office	14,453	2.7	31	13	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	10.2	116	47	0.0
Poison Buttes	BLM Rawlins Field Office	6,381	3.7	43	17	0.0
Riner	BLM Rawlins Field Office	59,505	0.1	2	1	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	130	53	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	124	50	0.0
South Pine Butte	BLM Rawlins Field Office	1,409	1.6	18	7	0.0
V Spreaders	BLM Rawlins Field Office	694	1.2	14	6	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Big Bend	BLM Little Snake Field Office	1,607	1.9	21	9	0.0
Cedar	BLM Little Snake Field Office	7,590	1.9	22	9	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	9.1	104	42	0.0
Chicken Sage	BLM Little Snake Field Office	4,593	2.5	28	11	0.0
Cutoff Gulch	BLM Little Snake Field Office	2,016	0.5	6	2	0.0
Gravel Pit	BLM Little Snake Field Office	1,618	1.6	18	7	0.0
Horse Gulch Sect 15	BLM Little Snake Field Office	37,277	9.6	109	44	0.0
Juniper Mountain	BLM Little Snake Field Office	13,418	2.5	29	12	0.0
Lay Creek	BLM Little Snake Field Office	2,788	1.9	21	9	0.0
Lay Peak Common	BLM Little Snake Field Office	1,680	1.0	11	4	0.0
Little Juniper	BLM Little Snake Field Office	2,657	1.8	20	8	0.0
Lower Fortification	BLM Little Snake Field Office	1,968	1.2	14	6	0.0
N Deception Creek	BLM Little Snake Field Office	13,028	5.3	61	24	0.0
North Pole Gulch	BLM Little Snake Field Office	2,221	1.4	16	7	0.0
State Block Eu	BLM Little Snake Field Office	12,812	6.7	77	31	0.0
West Four Mile	BLM Little Snake Field Office	4,279	2.0	22	9	0.0
West Wapiti Peak	BLM Little Snake Field Office	10,411	3.4	38	15	0.0
Elk Springs	BLM White River Field Office	26,620	8.2	93	37	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	30	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,406,797	205.4	2,342	945	0.0
17958	Wyoming State Lands	960	0.2	2	1	0.0
25993	Wyoming State Lands	2,637	0.6	6	3	0.0
30742	Wyoming State Lands	639	1.0	11	4	0.0
34394	Wyoming State Lands	200	0.2	2	1	0.0
34759	Wyoming State Lands	320	0.8	10	4	0.0
36220	Wyoming State Lands	799	0.3	3	1	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	11	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	1.0	12	5	0.0
C & C Cattle, LLC	Colorado State Land Board	7,961	4.8	55	22	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
Wilton Earle & Sons	Colorado State Land Board	3,561	2.7	31	13	0.0
Clarence Hannong, Jr.	Colorado State Land Board	317	0.8	10	4	0.0
Clifford T. Henderson	Colorado State Land Board	1,801	2.0	23	9	0.0
John Peroulis & Sons	Colorado State Land Board	8,010	4.2	48	19	0.0
John Raftopoulos	Colorado State Land Board	1,990	1.4	16	6	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
Visintainer Sheep Company	Colorado State Land Board	3,259	2.4	27	11	0.0
State Total		39,639	25.0	285	115	0.0
Grand Total		1,425,227	215.7	2,459	992	0.0
Alternative WYCO-F						
Big Robber	BLM Rawlins Field Office	20,463	7.3	84	34	0.0
Chace Block	BLM Rawlins Field Office	67,290	4.5	52	21	0.0
Cottonwood Hill	BLM Rawlins Field Office	16,039	6.7	76	31	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	18	0.0
Dana Block North	BLM Rawlins Field Office	70,878	16.6	189	78	0.0
Doty Mountain	BLM Rawlins Field Office	96,139	1.0	11	5	0.0
East Muddy	BLM Rawlins Field Office	25,034	3.2	36	15	0.0
Echo Springs	BLM Rawlins Field Office	37,788	5.8	66	27	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	5	2	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	3.6	41	17	0.0
Mexican Flats	BLM Rawlins Field Office	16,775	3.8	43	18	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	52	22	0.0
Not named	BLM Rawlins Field Office	442,935	18.4	210	86	0.0
Oppenheimer	BLM Rawlins Field Office	14,453	1.6	18	7	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	9.2	105	43	0.0
Powder Rim Rotati	BLM Rawlins Field Office	46,706	14.8	169	70	0.0
Quealey Block	BLM Rawlins Field Office	23,782	1.5	18	7	0.0
Red Creek	BLM Rawlins Field Office	32,701	0.6	6	3	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	130	54	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	124	51	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
South Flat Top	BLM Rawlins Field Office	17,978	3.0	34	14	0.0
South Laclede	BLM Rawlins Field Office	53,035	12.3	141	58	0.0
South Wamsutter	BLM Rawlins Field Office	32,817	7.1	81	34	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	7.7	87	36	0.0
East Powder Wash	BLM Little Snake Field Office	27,154	3.8	44	18	0.0
Grounds	BLM Little Snake Field Office	8,012	2.1	24	10	0.0
Horse Draw	BLM Little Snake Field Office	7,414	1.8	21	8	0.0
Nipple Peak	BLM Little Snake Field Office	15,560	5.3	60	25	0.0
Powder Wash	BLM Little Snake Field Office	27,432	1.8	20	8	0.0
Sand Wash	BLM Little Snake Field Office	76,108	2.4	28	11	0.0
Shepherd Spring	BLM Little Snake Field Office	86,354	4.7	53	22	0.0
Snake River	BLM Little Snake Field Office	62,469	11.3	129	53	0.0
West Wapiti Peak	BLM Little Snake Field Office	10,411	3.6	41	17	0.0
Elk Springs	BLM White River Field Office	26,620	8.0	92	38	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	31	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,780,321	212.9	2,427	1,000	0.0
17958	Wyoming State Lands	960	0.4	4	2	0.0
30742	Wyoming State Lands	639	1.0	11	5	0.0
36220	Wyoming State Lands	799	0.6	7	3	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	11	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	0.0	0	0	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
John A. Maneotis	Colorado State Land Board	5,125	3.1	35	14	0.0
Nottingham Land & Livestock	Colorado State Land Board	8,885	4.2	48	20	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
Visintainer Sheep Company	Colorado State Land Board	3,259	1.0	12	5	0.0
State Total		27,768	14.9	169	70	0.0
Grand Total		1,790,369	215.9	2,461	1,015	0.0
Route Variation WYCO-F-1						
Big Robber	BLM Rawlins Field Office	20,463	7.3	84	34	0.0
Chace Block	BLM Rawlins Field Office	67,290	4.5	52	21	0.0
Cottonwood Hill	BLM Rawlins Field Office	16,039	6.7	76	31	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	18	0.0
Dana Block North	BLM Rawlins Field Office	70,878	16.6	191	76	0.0
Doty Mountain	BLM Rawlins Field Office	96,139	1.0	12	5	0.0
East Muddy	BLM Rawlins Field Office	25,034	3.2	37	15	0.0
Echo Springs	BLM Rawlins Field Office	37,788	5.8	67	27	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	6	2	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	3.6	42	17	0.0
Mexican Flats	BLM Rawlins Field Office	16,775	3.8	44	17	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	53	21	0.0
Not named	BLM Rawlins Field Office	442,935	18.4	211	85	0.0
Oppenheimer	BLM Rawlins Field Office	14,453	1.6	18	7	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	9.2	105	42	0.0
Powder Rim Rotati	BLM Rawlins Field Office	46,706	14.8	170	68	0.0
Quealey Block	BLM Rawlins Field Office	23,782	1.5	18	7	0.0
Red Creek	BLM Rawlins Field Office	32,701	0.6	6	3	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	131	53	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	125	50	0.0
South Flat Top	BLM Rawlins Field Office	17,978	3.0	35	14	0.0
South Laclede	BLM Rawlins Field Office	53,035	12.3	142	57	0.0
South Wamsutter	BLM Rawlins Field Office	32,817	7.1	82	33	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	7.7	88	35	0.0
East Powder Wash	BLM Little Snake Field Office	27,154	3.8	44	18	0.0
Grounds	BLM Little Snake Field Office	8,012	2.1	24	10	0.0
Horse Draw	BLM Little Snake Field Office	7,414	1.8	21	8	0.0
Nipple Peak	BLM Little Snake Field Office	15,560	5.3	61	24	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Powder Wash	BLM Little Snake Field Office	27,432	1.8	21	8	0.0
Sand Wash	BLM Little Snake Field Office	76,108	2.4	28	11	0.0
Sheepherder Spring	BLM Little Snake Field Office	86,354	4.7	53	21	0.0
Snake River	BLM Little Snake Field Office	62,469	11.8	135	54	0.0
West Wapiti Peak	BLM Little Snake Field Office	10,411	3.6	42	17	0.0
Elk Springs	BLM White River Field Office	26,620	8.0	92	37	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	30	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,780,321	213.3	2,453	981	0.0
17958	Wyoming State Lands	960	0.4	4	2	0.0
30742	Wyoming State Lands	639	1.0	11	4	0.0
36220	Wyoming State Lands	799	0.6	7	3	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	12	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	0.0	0	0	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
John A. Maneotis	Colorado State Land Board	5,125	3.1	35	14	0.0
Nottingham Land & Livestock	Colorado State Land Board	8,885	4.2	48	19	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
State Total		24,507	13.9	159	64	0.0
Grand Total		1,787,747	216.4	2,489	995	0.0
Route Variation WYCO-F-2						
Big Robber	BLM Rawlins Field Office	20,463	7.3	84	34	0.0
Chace Block	BLM Rawlins Field Office	67,290	4.5	52	21	0.0
Cottonwood Hill	BLM Rawlins Field Office	16,039	6.7	76	31	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	18	0.0
Dana Block North	BLM Rawlins Field Office	70,878	16.6	189	76	0.0
Doty Mountain	BLM Rawlins Field Office	96,139	1.0	11	5	0.0
East Muddy	BLM Rawlins Field Office	25,034	3.2	36	15	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Echo Springs	BLM Rawlins Field Office	37,788	5.8	66	27	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	5	2	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	3.6	41	17	0.0
Mexican Flats	BLM Rawlins Field Office	16,775	3.8	43	17	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	52	21	0.0
Not named	BLM Rawlins Field Office	442,935	18.4	210	85	0.0
Oppenheimer	BLM Rawlins Field Office	14,453	1.6	18	7	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	9.2	105	42	0.0
Powder Rim Rotati	BLM Rawlins Field Office	46,706	14.8	169	68	0.0
Quealey Block	BLM Rawlins Field Office	23,782	1.5	18	7	0.0
Red Creek	BLM Rawlins Field Office	32,701	0.6	6	3	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	130	53	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	124	50	0.0
South Flat Top	BLM Rawlins Field Office	17,978	3.0	34	14	0.0
South Laclede	BLM Rawlins Field Office	53,035	12.3	141	57	0.0
South Wamsutter	BLM Rawlins Field Office	32,817	7.1	81	33	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	7.1	81	33	0.0
Disappointment	BLM Little Snake Field Office	32,302	3.6	41	17	0.0
East Powder Wash	BLM Little Snake Field Office	27,154	3.8	44	18	0.0
Grounds	BLM Little Snake Field Office	8,012	2.1	24	10	0.0
Horse Draw	BLM Little Snake Field Office	7,414	1.8	21	8	0.0
Nipple Peak	BLM Little Snake Field Office	15,560	5.3	60	24	0.0
Powder Wash	BLM Little Snake Field Office	27,432	1.8	20	8	0.0
Sand Wash	BLM Little Snake Field Office	76,108	2.4	28	11	0.0
Shepherd Spring	BLM Little Snake Field Office	86,354	4.7	53	21	0.0
Snake River	BLM Little Snake Field Office	62,469	11.3	129	52	0.0
Elk Springs	BLM White River Field Office	26,620	8.3	95	38	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	30	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,802,212	212.6	2,423	978	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
17958	Wyoming State Lands	960	0.4	4	2	0.0
30742	Wyoming State Lands	639	1.0	11	4	0.0
36220	Wyoming State Lands	799	0.6	7	3	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	11	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	0.0	0	0	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
John A. Maneotis	Colorado State Land Board	5,125	3.1	35	14	0.0
Nottingham Land & Livestock	Colorado State Land Board	8,885	4.2	48	19	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
Visintainer Sheep Company	Colorado State Land Board	3,259	1.0	12	5	0.0
State Total		27,768	14.9	169	68	0.0
Grand Total		1,811,621	215.6	2,458	992	0.0
Route Variation WYCO-F-3						
Big Robber	BLM Rawlins Field Office	20,463	7.3	84	34	0.0
Chace Block	BLM Rawlins Field Office	67,290	4.5	52	21	0.0
Cottonwood Hill	BLM Rawlins Field Office	16,039	6.7	76	31	0.0
Daley Ranch	BLM Rawlins Field Office	24,587	3.9	44	18	0.0
Dana Block North	BLM Rawlins Field Office	70,878	16.6	191	78	0.0
Doty Mountain	BLM Rawlins Field Office	96,139	1.0	12	5	0.0
East Muddy	BLM Rawlins Field Office	25,034	3.2	37	15	0.0
Echo Springs	BLM Rawlins Field Office	37,788	5.8	67	27	0.0
Ellis Block	BLM Rawlins Field Office	34,530	0.5	6	2	0.0
Lazy Y S Ranch	BLM Rawlins Field Office	17,834	3.6	42	17	0.0
Mexican Flats	BLM Rawlins Field Office	16,775	3.8	44	18	0.0
North Walcott	BLM Rawlins Field Office	73,724	4.6	53	22	0.0
Not named	BLM Rawlins Field Office	442,935	18.4	211	86	0.0
Oppenheimer	BLM Rawlins Field Office	14,453	1.6	18	7	0.0
Pass Creek Ridge	BLM Rawlins Field Office	59,168	9.2	105	43	0.0
Powder Rim Rotati	BLM Rawlins Field Office	46,706	14.8	170	70	0.0
Quealey Block	BLM Rawlins Field Office	23,782	1.5	18	7	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Red Creek	BLM Rawlins Field Office	32,701	0.6	6	3	0.0
Riner	BLM Rawlins Field Office	59,505	11.4	131	54	0.0
Sixteen Mile	BLM Rawlins Field Office	82,186	10.9	125	51	0.0
South Flat Top	BLM Rawlins Field Office	17,978	3.0	35	14	0.0
South Laclede	BLM Rawlins Field Office	53,035	12.3	142	58	0.0
South Wamsutter	BLM Rawlins Field Office	32,817	7.1	82	34	0.0
Cedar Springs Draw	BLM Little Snake Field Office	35,489	7.8	90	37	0.0
East Powder Wash	BLM Little Snake Field Office	27,154	3.8	44	18	0.0
Grounds	BLM Little Snake Field Office	8,012	2.1	24	10	0.0
Horse Draw	BLM Little Snake Field Office	7,414	1.8	21	8	0.0
Nipple Peak	BLM Little Snake Field Office	15,560	5.3	61	25	0.0
Powder Wash	BLM Little Snake Field Office	27,432	1.8	21	8	0.0
Sand Wash	BLM Little Snake Field Office	76,108	2.4	28	11	0.0
Shepherd Spring	BLM Little Snake Field Office	86,354	4.7	53	22	0.0
Snake River	BLM Little Snake Field Office	62,469	11.3	130	53	0.0
West Wapiti Peak	BLM Little Snake Field Office	10,411	3.4	39	16	0.0
Elk Springs	BLM White River Field Office	26,620	8.2	94	38	0.0
Horse Draw	BLM White River Field Office	17,761	6.6	75	31	0.0
Massadona	BLM White River Field Office	10,871	0.6	6	3	0.0
White River Trail	BLM White River Field Office	928	0.8	9	4	0.0
Winter Valley Gulch	BLM White River Field Office	1,564	0.1	1	0	0.0
BLM Total⁴		1,780,321	212.9	2,448	1,001	0.0
17958	Wyoming State Lands	960	0.4	4	2	0.0
30742	Wyoming State Lands	639	1.0	11	5	0.0
36220	Wyoming State Lands	799	0.6	7	3	0.0
Mar-53; Wl-1101	Wyoming State Lands	638	1.0	12	5	0.0
Mar-97; Wl-1101	Wyoming State Lands	639	1.0	12	5	0.0
No lease number identified	Wyoming State Lands	1,751	0.0	0	0	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	1.0	12	5	0.0
John A. Maneotis	Colorado State Land Board	5,125	3.1	35	14	0.0
Nottingham Land & Livestock	Colorado State Land Board	8,885	4.2	48	20	0.0
Three Springs Ranch Corporation	Colorado State Land Board	641	0.9	10	4	0.0

TABLE G-1
GRAZING ALLOTMENTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Albert F. Villard	Colorado State Land Board	600	0.7	8	3	0.0
Visintainer Sheep Company	Colorado State Land Board	3,259	1.0	12	5	0.0
State Total		27,768	14.9	171	70	0.0
Grand Total		1,790,369	216.0	2,484	1,015	0.0

NOTES:

The agency total allotment acreage and the miles crossed do not equal a sum of each agency's total allotment acreage or miles crossed, due to overlap of allotment boundaries. Also, the grand-total acreage and the miles crossed do not equal a sum of each agency's total allotment acreage or miles crossed due to overlap of allotment boundaries.

¹Temporary Disturbance: Estimated area of disturbance associated with structure work areas, wire pulling-and-tensioning sites, wire-splicing sites, multi-purpose construction yards, helicopter fly yards, guard structures, and temporary access roads (refer to Environmental Impact Statement [EIS] Table 2-1).

²Permanent Disturbance: Estimated area of disturbance associated with the area occupied by structures-(pads), communication regeneration stations, substations and series compensation stations, and permanent access roads (refer to EIS Table 2-2).

³All percentages of allotments disturbed are less than 0.1 percent. Due to rounding, the percentages are shown as 0.0 percent.

⁴For the BLM White River Field Office, the unit called "Unallotted" has not been included in the numbers above.

BLM = Bureau of Land Management

USFS = U.S. Forest Service

TABLE G-2
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Alternative COUT BAX-B						
Cathedral Bluffs	BLM White River Field Office	107,887	0.7	8	4	0.0
Douglas Creek	BLM White River Field Office	5,405	3.2	37	19	0.0
Evacuation Creek	BLM White River Field Office	114,907	20.6	235	120	0.0
Hall Draw	BLM White River Field Office	6,940	2.2	25	13	0.0
Hatch Flat	BLM White River Field Office	1,493	0.8	9	4	0.0
Johnson/Trujillo	BLM White River Field Office	19,376	2.1	24	12	0.0
Lower Fletcher Draw	BLM White River Field Office	9,868	2.3	26	13	0.0
Massadona	BLM White River Field Office	10,871	1.7	19	10	0.0
Red Wash	BLM White River Field Office	8,219	2.3	26	13	0.0
Spooky Mountain	BLM White River Field Office	29,666	0.7	8	4	0.0
Spring Creek	BLM White River Field Office	40,229	5.2	59	30	0.0
Twin Buttes	BLM White River Field Office	158,651	15.1	172	87	0.0
West Salt Common	BLM Grand Junction Field Office	104,147	20.3	231	118	0.0
Athena	BLM Moab Field Office	46,488	6.0	69	35	0.0
Bar-X	BLM Moab Field Office	21,244	1.5	17	8	0.0
Cisco	BLM Moab Field Office	154,005	21.1	241	122	0.0
Cisco Mesa	BLM Moab Field Office	57,704	9.4	108	55	0.0
Crescent Canyon	BLM Moab Field Office	28,077	5.5	63	32	0.0
Floy Creek	BLM Moab Field Office	24,776	4.6	52	27	0.0
Horse Canyon	BLM Moab Field Office	43,290	6.0	68	35	0.0
Pipeline	BLM Moab Field Office	15,870	4.4	50	25	0.0
San Arroyo	BLM Moab Field Office	139,053	16.4	187	95	0.0
Buckhorn	BLM Price Field Office	47,156	7.1	81	41	0.0
Buckmaster	BLM Price Field Office	55,934	10.8	123	63	0.0
Chimney Rock Flat	BLM Price Field Office	46,641	16.3	185	94	0.0
Little Holes	BLM Price Field Office	10,477	4.5	51	26	0.0
Little Valley	BLM Price Field Office	18,091	5.9	67	34	0.0
Oil Dome	BLM Price Field Office	1,349	1.0	12	6	0.0
R.J.	BLM Price Field Office	2,621	0.6	7	3	0.0
Red Seeps	BLM Price Field Office	25,494	5.6	64	33	0.0
West Huntington	BLM Price Field Office	17,384	7.0	80	41	0.0

**TABLE G-2
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES**

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Wilberg	BLM Price Field Office	5,509	1.0	12	6	0.0
Apple Spring	BLM Richfield Field Office	3,806	2.7	30	15	0.0
Hop Creek	BLM Richfield Field Office	2,566	2.0	22	11	0.0
Indian Hollow	BLM Richfield Field Office	1,774	1.4	16	8	0.0
BLM Total⁴		1,386,840	217.7	2,482	1,263	0.0
Booth Canyon	Manti-La Sal National Forest	2,671	0.9	11	5	0.0
East Mountain	Manti-La Sal National Forest	11,028	2.4	28	14	0.0
Gentry	Manti-La Sal National Forest	5,162	2.3	26	13	0.0
Joes Valley	Manti-La Sal National Forest	8,185	1.7	19	10	0.0
Out	Manti-La Sal National Forest	7,830	0.6	6	3	0.0
Potter Canyon	Manti-La Sal National Forest	2,577	2.7	31	16	0.0
Private Land Permit	Manti-La Sal National Forest	9,053	2.3	26	13	0.0
Skyline S & G	Manti-La Sal National Forest	8,011	2.0	23	12	0.0
South Skyline S & G	Manti-La Sal National Forest	11,683	0.4	4	2	0.0
Trail Mountain	Manti-La Sal National Forest	23,763	4.6	53	27	0.0
USFS Total		89,963	20.0	228	116	0.0
Anderson Brothers	Utah School and Institutional Trust Lands	568	1.1	12	6	0.0
Betty Smith	Utah School and Institutional Trust Lands	26,093	8.8	100	51	0.0
Cory Cloward	Utah School and Institutional Trust Lands	989	0.7	8	4	0.0
Craig Bair	Utah School and Institutional Trust Lands	11,222	0.4	4	2	0.0
Division Of Wildlife Resources	Utah School and Institutional Trust Lands	12,748	0.3	4	2	0.0
Donley Ranches, LLC	Utah School and Institutional Trust Lands	1,928	0.7	8	4	0.0
Guymon, Courtney	Utah School and Institutional Trust Lands	11,147	6.2	71	36	0.0
Hatch Livestock	Utah School and Institutional Trust Lands	26,095	6.2	71	36	0.0
Holyoak Land & Livestock	Utah School and Institutional Trust Lands	160	0.3	3	2	0.0
Donald W. Holyoak,	Utah School and Institutional Trust Lands	11,002	0.7	8	4	0.0
Paul Holyoak	Utah School and Institutional Trust Lands	9,118	0.3	4	2	0.0
Jimmy L. or Patsy Allred	Utah School and Institutional Trust Lands	1,102	0.8	9	4	0.0
Johansen Herefords, LLC	Utah School and Institutional Trust Lands	318	0.2	2	1	0.0
John Vetere, Jr.	Utah School and Institutional Trust Lands	1,915	0.5	5	3	0.0
Kirk and Kris Shiner	Utah School and Institutional Trust Lands	2,242	1.1	13	7	0.0
Lee McElprang	Utah School and Institutional Trust Lands	24,264	6.2	71	36	0.0

TABLE G-2
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Leon McElprang	Utah School and Institutional Trust Lands	9,592	6.2	71	36	0.0
Leon McElprang	Utah School and Institutional Trust Lands	23,977	6.2	71	36	0.0
Thomas McElprang	Utah School and Institutional Trust Lands	9,946	6.2	71	36	0.0
Wayde S. Nielsen	Utah School and Institutional Trust Lands	639	1.2	13	7	0.0
Randy Campbell and	Utah School and Institutional Trust Lands	1,928	0.5	6	3	0.0
Sacco Brothers Land & Livestock Company	Utah School and Institutional Trust Lands	11,189	4.0	45	23	0.0
Nick And Toni Sampinos	Utah School and Institutional Trust Lands	2,303	1.6	18	9	0.0
The Earl and Sheila Gordon Trust	Utah School and Institutional Trust Lands	22,810	6.2	71	36	0.0
Jessie May Winder	Utah School and Institutional Trust Lands	680	0.3	3	2	0.0
State Total		93,504	28.3	322	164	0.0
Grand Total		1,502,421	239.5	2,730	1,389	0.0
Alternative COUT BAX-C						
Cathedral Bluffs	BLM White River Field Office	107,887	0.7	8	4	0.0
Douglas Creek	BLM White River Field Office	5,405	3.2	37	18	0.0
Evacuation Creek	BLM White River Field Office	114,907	20.6	235	113	0.0
Hall Draw	BLM White River Field Office	6,940	2.2	25	12	0.0
Hatch Flat	BLM White River Field Office	1,493	0.8	9	4	0.0
Johnson/Trujillo	BLM White River Field Office	19,376	2.1	24	11	0.0
Lower Fletcher Draw	BLM White River Field Office	9,868	2.3	26	13	0.0
Massadona	BLM White River Field Office	10,871	1.7	19	9	0.0
Red Wash	BLM White River Field Office	8,219	2.3	26	13	0.0
Spooky Mountain	BLM White River Field Office	29,666	0.7	8	4	0.0
Spring Creek	BLM White River Field Office	40,229	5.2	59	28	0.0
Twin Buttes	BLM White River Field Office	158,651	15.1	172	83	0.0
West Salt Common	BLM Grand Junction Field Office	104,147	20.3	231	112	0.0
Athena	BLM Moab Field Office	46,488	6.0	69	33	0.0
Bar-X	BLM Moab Field Office	21,244	1.5	17	8	0.0
Cisco	BLM Moab Field Office	154,005	21.1	241	116	0.0
Cisco Mesa	BLM Moab Field Office	57,704	9.4	108	52	0.0
Crescent Canyon	BLM Moab Field Office	28,077	5.5	63	30	0.0
Floy Creek	BLM Moab Field Office	24,776	4.6	52	25	0.0

TABLE G-2
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Horse Canyon	BLM Moab Field Office	43,290	6.0	68	33	0.0
Pipeline	BLM Moab Field Office	15,870	4.4	50	24	0.0
San Arroyo	BLM Moab Field Office	139,053	16.4	187	90	0.0
Buckhorn	BLM Price Field Office	47,156	6.8	77	37	0.0
Buckmaster	BLM Price Field Office	55,934	4.3	49	23	0.0
Calf Canyon	BLM Price Field Office	7,561	0.1	1	0	0.0
Chimney Rock Flat	BLM Price Field Office	46,641	10.4	119	57	0.0
Closed to Grazing	BLM Price Field Office	14,566	9.1	104	50	0.0
Desert	BLM Price Field Office	60,902	5.3	61	29	0.0
Little Holes	BLM Price Field Office	10,477	4.3	49	24	0.0
Little Valley	BLM Price Field Office	18,091	5.9	67	32	0.0
Oil Dome	BLM Price Field Office	1,349	1.0	12	6	0.0
R.J.	BLM Price Field Office	2,621	0.6	7	3	0.0
Red Seeps	BLM Price Field Office	25,494	5.6	64	31	0.0
Summerville	BLM Price Field Office	33,272	6.6	75	36	0.0
Trail Springs	BLM Price Field Office	27,384	2.2	25	12	0.0
West Huntington	BLM Price Field Office	17,384	7.0	80	39	0.0
Wilberg	BLM Price Field Office	5,509	1.0	12	6	0.0
Apple Spring	BLM Richfield Field Office	3,806	2.7	30	15	0.0
Hop Creek	BLM Richfield Field Office	2,566	2.0	22	11	0.0
Indian Hollow	BLM Richfield Field Office	1,774	1.4	16	8	0.0
BLM Total⁴		1,530,524	228.2	2,601	1,255	0.0
Booth Canyon	Manti-La Sal National Forest	2,671	0.9	11	5	0.0
East Mountain	Manti-La Sal National Forest	11,028	2.4	28	13	0.0
Gentry	Manti-La Sal National Forest	5,162	2.3	26	13	0.0
Joes Valley	Manti-La Sal National Forest	8,185	1.7	19	9	0.0
Out	Manti-La Sal National Forest	7,830	0.6	6	3	0.0
Potter Canyon	Manti-La Sal National Forest	2,577	2.7	31	15	0.0
Private Land Permit	Manti-La Sal National Forest	9,053	2.3	26	13	0.0
Skyline S & G	Manti-La Sal National Forest	8,011	2.0	23	11	0.0

TABLE G-2
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
South Skyline S & G	Manti-La Sal National Forest	11,683	0.4	4	2	0.0
Trail Mountain	Manti-La Sal National Forest	23,763	4.6	53	25	0.0
USFS Total		89,963	20.0	228	110	0.0
Anderson Brothers	Utah School and Institutional Trust Lands	568	1.1	12	6	0.0
Betty Smith	Utah School and Institutional Trust Lands	26,093	8.9	101	49	0.0
Cory Cloward	Utah School and Institutional Trust Lands	989	0.7	8	4	0.0
Craig Bair	Utah School and Institutional Trust Lands	11,222	0.4	4	2	0.0
Division Of Wildlife Resources	Utah School and Institutional Trust Lands	12,748	0.3	4	2	0.0
Donley Ranches, LLC	Utah School and Institutional Trust Lands	1,928	0.7	8	4	0.0
Courtney Guymon	Utah School and Institutional Trust Lands	11,147	6.2	71	34	0.0
Hatch Livestock	Utah School and Institutional Trust Lands	26,095	6.2	71	34	0.0
Holyoak Land & Livestock	Utah School and Institutional Trust Lands	160	0.3	3	2	0.0
Donald W. Holyoak	Utah School and Institutional Trust Lands	11,002	0.7	8	4	0.0
Paul Holyoak	Utah School and Institutional Trust Lands	9,118	0.3	4	2	0.0
Jimmy L. or Patsy Allred	Utah School and Institutional Trust Lands	1,102	0.8	9	4	0.0
Johansen Herefords, LLC	Utah School and Institutional Trust Lands	318	0.2	2	1	0.0
John Vetere, Jr.	Utah School and Institutional Trust Lands	1,915	0.5	5	3	0.0
Kirk and Kris Shiner	Utah School and Institutional Trust Lands	2,242	1.1	13	6	0.0
Lee McElprang	Utah School and Institutional Trust Lands	24,264	6.2	71	34	0.0
Leon Mc Elprang	Utah School and Institutional Trust Lands	9,592	6.2	71	34	0.0
Leon McElprang	Utah School and Institutional Trust Lands	23,977	6.2	71	34	0.0
Thomas McElprang	Utah School and Institutional Trust Lands	9,946	6.2	71	34	0.0
Wayde S. Nielsen	Utah School and Institutional Trust Lands	639	1.2	13	6	0.0
Randy Campbell and	Utah School and Institutional Trust Lands	1,928	0.5	6	3	0.0
Sacco Brothers Land & Livestock Company	Utah School and Institutional Trust Lands	11,189	4.4	50	24	0.0
Rex L. Sacco	Utah School and Institutional Trust Lands	3,121	2.1	24	12	0.0
Nick and Toni Sampinos	Utah School and Institutional Trust Lands	2,303	1.6	18	9	0.0
The Earl and Sheila Gordon Trust	Utah School and Institutional Trust Lands	22,810	6.2	71	34	0.0
Jessie May Winder	Utah School and Institutional Trust Lands	680	0.3	3	2	0.0
State Total		96,625	30.9	352	170	0.0
Grand Total		1,645,002	250.0	2,850	1,375	0.0

**TABLE G-2
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES**

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Alternative COUT BAX-E						
Cathedral Bluffs	BLM White River Field Office	107,887	0.7	9	4	0.0
Douglas Creek	BLM White River Field Office	5,405	3.2	37	16	0.0
Evacuation Creek	BLM White River Field Office	114,907	20.6	237	101	0.0
Hall Draw	BLM White River Field Office	6,940	2.2	25	11	0.0
Hatch Flat	BLM White River Field Office	1,493	0.8	9	4	0.0
Johnson/Trujillo	BLM White River Field Office	19,376	2.1	24	10	0.0
Lower Fletcher Draw	BLM White River Field Office	9,868	2.3	27	11	0.0
Massadona	BLM White River Field Office	10,871	1.7	19	8	0.0
Red Wash	BLM White River Field Office	8,219	2.3	27	11	0.0
Spooky Mountain	BLM White River Field Office	29,666	0.7	8	3	0.0
Spring Creek	BLM White River Field Office	40,229	5.2	59	25	0.0
Twin Buttes	BLM White River Field Office	158,651	15.1	173	74	0.0
West Salt Common	BLM Grand Junction Field Office	104,147	20.3	233	99	0.0
Athena	BLM Moab Field Office	46,488	6.0	69	30	0.0
Bar-X	BLM Moab Field Office	21,244	1.5	17	7	0.0
Cisco	BLM Moab Field Office	154,005	21.1	243	103	0.0
Cisco Mesa	BLM Moab Field Office	57,704	9.4	108	46	0.0
Crescent Canyon	BLM Moab Field Office	28,077	5.5	63	27	0.0
Floy Creek	BLM Moab Field Office	24,776	4.6	53	22	0.0
Horse Canyon	BLM Moab Field Office	43,290	6.0	69	29	0.0
Pipeline	BLM Moab Field Office	15,870	4.4	50	21	0.0
San Arroyo	BLM Moab Field Office	139,053	16.4	189	80	0.0
Buckmaster	BLM Price Field Office	55,934	4.3	49	21	0.0
Closed to Grazing	BLM Price Field Office	14,566	9.1	105	45	0.0
Coon Spring	BLM Price Field Office	11,319	9.2	106	45	0.0
Desert	BLM Price Field Office	60,902	9.7	111	47	0.0
Gordon Creek Withdrawal	BLM Price Field Office	21,837	3.4	39	17	0.0
Hiawatha	BLM Price Field Office	5,235	2.8	32	14	0.0
Icelander	BLM Price Field Office	49,564	5.7	65	28	0.0
Little Valley	BLM Price Field Office	18,091	5.9	67	29	0.0
Long Bench	BLM Price Field Office	7,572	3.1	36	15	0.0

TABLE G-2
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Mathis Wash	BLM Price Field Office	5,230	2.0	23	10	0.0
Mounds	BLM Price Field Office	23,077	8.4	97	41	0.0
Mud Springs	BLM Price Field Office	31,495	3.8	44	19	0.0
North Spring	BLM Price Field Office	7,864	0.8	9	4	0.0
Oviatt	BLM Price Field Office	453	1.3	15	6	0.0
South Olsen Lake	BLM Price Field Office	1,897	2.8	32	14	0.0
Staker	BLM Price Field Office	679	0.8	9	4	0.0
Summerville	BLM Price Field Office	33,272	0.5	6	3	0.0
Trail Canyon	BLM Price Field Office	5,860	3.8	43	18	0.0
Washboard	BLM Price Field Office	11,222	4.4	50	21	0.0
Wattis	BLM Price Field Office	5,744	2.6	30	13	0.0
Hop Creek	BLM Richfield Field Office	2,566	1.3	14	6	0.0
Uinta	BLM Richfield Field Office	1,028	1.2	13	6	0.0
BLM Total⁴		1,523,442	238.7	2,745	1,170	0.0
Beaver Dams/Boulger	Manti-La Sal National Forest	4,801	0.7	8	3	0.0
Burnout	Manti-La Sal National Forest	4,254	3.0	35	15	0.0
Gooseberry–Cottonwood	Manti-La Sal National Forest	4,668	2.8	32	14	0.0
Private Land	Manti-La Sal National Forest	6,491	2.1	25	10	0.0
Private Land Permit	Manti-La Sal National Forest	9,053	1.4	17	7	0.0
Swens Canyon	Manti-La Sal National Forest	2,072	1.2	14	6	0.0
USFS Total		31,339	11.3	130	55	0.0
Betty Smith	Utah School and Institutional Trust Lands	26,093	1.4	16	7	0.0
Bill Fasselin	Utah School and Institutional Trust Lands	2,101	2.0	23	10	0.0
Craig Bair	Utah School and Institutional Trust Lands	11,222	0.4	4	2	0.0
Division Of Wildlife Resources	Utah School and Institutional Trust Lands	12,748	0.3	4	2	0.0
Donley Ranches, LLC	Utah School and Institutional Trust Lands	1,928	0.7	8	3	0.0
Bill and Jennie Fasselin	Utah School and Institutional Trust Lands	3,583	2.5	28	12	0.0
Holyoak Land & Livestock	Utah School and Institutional Trust Lands	160	0.3	3	1	0.0
Donald W. Holyoak	Utah School and Institutional Trust Lands	11,002	0.7	8	3	0.0
Paul Holyoak	Utah School and Institutional Trust Lands	9,118	0.3	4	2	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	1.3	14	6	0.0
Jimmy L. or Patsy Allred	Utah School and Institutional Trust Lands	1,102	0.8	9	4	0.0

**TABLE G-2
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES**

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
John Vetere Jr	Utah School and Institutional Trust Lands	1,915	0.5	6	2	0.0
Kirk and Kris Shiner	Utah School and Institutional Trust Lands	2,242	1.1	13	6	0.0
Randy Campbell and	Utah School and Institutional Trust Lands	1,928	0.5	6	2	0.0
Ray and Carolyn Jorgensen	Utah School and Institutional Trust Lands	3,195	1.8	21	9	0.0
Sacco Brothers Land & Livestock Company	Utah School and Institutional Trust Lands	11,189	2.2	26	11	0.0
Rex L. Sacco	Utah School and Institutional Trust Lands	3,121	2.1	24	10	0.0
Nick and Toni Sampinos	Utah School and Institutional Trust Lands	2,303	1.6	18	8	0.0
James Allen Staker	Utah School and Institutional Trust Lands	1,278	1.0	12	5	0.0
Joel Stamatakis	Utah School and Institutional Trust Lands	2,246	0.9	10	4	0.0
Steve and Vivien Stamatakis	Utah School and Institutional Trust Lands	2,246	0.9	10	4	0.0
State Total		84,023	20.9	241	103	0.0
Grand Total		1,595,145	252.8	2,907	1,239	0.0
NOTES: The agency total allotment acreage and the miles crossed do not equal a sum of each agency's total allotment acreage or miles crossed, due to overlap of allotment boundaries. Also, the grand-total acreage and the miles crossed do not equal a sum of each agency's total allotment acreage or miles crossed due to overlap of allotment boundaries. ¹Temporary Disturbance: Estimated area of disturbance associated with structure work areas, wire pulling-and-tensioning sites, wire-splicing sites, multi-purpose construction yards, helicopter fly yards, guard structures, and temporary access roads (refer to Environmental Impact Statement [EIS] Table 2-1). ²Permanent Disturbance: Estimated area of disturbance associated with the area occupied by structures-(pads), communication regeneration stations, substations and series compensation stations, and permanent access roads (refer to EIS Table 2-2). ³All percentages of allotments disturbed are less than 0.1 percent. Due to rounding, the percentages are shown as 0.0 percent. ⁴For the BLM White River Field Office, the unit called "Unallotted" has not been included in the numbers above. BLM = Bureau of Land Management USFS = U.S. Forest Service						

**TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES**

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Alternative COUT-A						
Artesia	BLM White River Field Office	48,931	9.3	108	64	0.0
Massadona	BLM White River Field Office	10,871	3.6	42	25	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	23	13	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	8	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	83	49	0.0
Antelope Draw	BLM Vernal Field Office	55,904	9.0	104	62	0.0
Bohemian Bottoms	BLM Vernal Field Office	11,544	4.2	48	29	0.0
Ouray Road	BLM Vernal Field Office	11,961	4.3	49	29	0.0
Powder Wash	BLM Vernal Field Office	26,783	6.5	75	45	0.0
Snake John	BLM Vernal Field Office	10,680	3.9	45	27	0.0
Split Mountain	BLM Vernal Field Office	120,800	9.2	106	63	0.0
Twelve Mile	BLM Vernal Field Office	32,190	4.7	54	32	0.0
ISO Tract - Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		371,993	64.8	751	447	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	7	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	8	4	0.0
Broad Hollow/Pete's Knoll	Uinta-Wasatch-Cache National Forest	5,161	2.5	29	17	0.0
Center Canyon	Uinta-Wasatch-Cache National Forest	5,324	2.8	33	19	0.0
Davis	Uinta-Wasatch-Cache National Forest	5,201	3.1	36	21	0.0
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	6.5	75	45	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	2.4	28	17	0.0
Trail Hollow	Uinta-Wasatch-Cache National Forest	2,687	1.3	15	9	0.0
USFS Total⁵		156,859	20.2	235	140	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	14	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	7	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	1.0	11	7	0.0
Chew Livestock, Inc.	Utah School and Institutional Trust Lands	1,281	0.2	3	2	0.0

**TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES**

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Nick Theos Family, LLP	Utah School and Institutional Trust Lands	3,376	2.8	32	19	0.0
Steven R. Pierson	Utah School and Institutional Trust Lands	1,297	1.2	13	8	0.0
State Total		11,071	8.2	95	57	0.0
Grand Total		531,423	85.0	986	587	0.0
Route Variation COUT-A-1						
Artesia	BLM White River Field Office	48,931	9.3	106	66	0.0
Massadona	BLM White River Field Office	10,871	3.6	41	26	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	22	14	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	8	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	82	51	0.0
Antelope Draw	BLM Vernal Field Office	55,904	9.0	102	64	0.0
Bohemian Bottoms	BLM Vernal Field Office	11,544	4.2	47	30	0.0
Ouray Road	BLM Vernal Field Office	11,961	4.3	48	30	0.0
Powder Wash	BLM Vernal Field Office	26,783	6.5	74	46	0.0
Snake John	BLM Vernal Field Office	10,680	3.9	44	27	0.0
Split Mountain	BLM Vernal Field Office	120,800	9.2	105	65	0.0
Twelve Mile	BLM Vernal Field Office	32,190	4.7	53	33	0.0
ISO Tract–Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		371,993	64.8	738	460	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	7	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	7	5	0.0
Broad Hollow/Pete's Knoll	Uinta-Wasatch-Cache National Forest	5,161	2.5	29	18	0.0
Center Canyon	Uinta-Wasatch-Cache National Forest	5,324	2.8	32	20	0.0
Chipman	Uinta-Wasatch-Cache National Forest	4,602	1.1	13	8	0.0
Davis	Uinta-Wasatch-Cache National Forest	5,201	0.9	10	6	0.0
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	6.5	74	46	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	2.7	31	19	0.0
Trail Hollow	Uinta-Wasatch-Cache National Forest	2,687	1.7	19	12	0.0
USFS Total⁵		161,461	19.8	226	141	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	14	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	7	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	1.0	11	7	0.0
Chew Livestock, Inc.	Utah School and Institutional Trust Lands	1,281	0.2	3	2	0.0
Nick Theos Family, LLP	Utah School and Institutional Trust Lands	3,376	2.8	32	20	0.0
Steven R. Pierson	Utah School and Institutional Trust Lands	1,297	1.2	13	8	0.0
State Total		11,071	8.2	93	58	0.0
Grand Total		536,025	845.0	9,633	6,000	0.0
Alternative COUT-B						
Artesia	BLM White River Field Office	48,931	9.3	108	62	0.0
Massadona	BLM White River Field Office	10,871	3.6	42	24	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	23	13	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	7	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	83	48	0.0
Antelope Draw	BLM Vernal Field Office	55,904	9.0	104	60	0.0
Bohemian Bottoms	BLM Vernal Field Office	11,544	4.2	48	28	0.0
Ouray Road	BLM Vernal Field Office	11,961	4.3	49	28	0.0
Powder Wash	BLM Vernal Field Office	26,783	6.5	75	43	0.0
Snake John	BLM Vernal Field Office	10,680	3.9	45	26	0.0
Split Mountain	BLM Vernal Field Office	120,800	9.2	106	61	0.0
Twelve Mile	BLM Vernal Field Office	32,190	4.7	54	31	0.0
Kyune I	BLM Price Field Office	14,506	4.4	51	29	0.0
Price Canyon–West	BLM Price Field Office	7,428	0.9	11	6	0.0
West Field Office, RK	BLM Price Field Office	16,706	4.8	55	32	0.0
ISO Tract–Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		410,633	74.8	868	501	0.0
Sowers Canyon	Ashley National Forest	20,986	12.0	139	80	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	6	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	8	4	0.0
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	2.0	24	14	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	1.9	21	12	0.0
USFS Total⁵		159,473	17.5	203	117	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	14	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Jack V. Foster	Colorado State Land Board	641	1.0	12	7	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	1.0	11	7	0.0
Chew Livestock, Inc.	Utah School and Institutional Trust Lands	1,281	0.2	3	1	0.0
George Lowe Children	Utah School and Institutional Trust Lands	950	1.1	12	7	0.0
James, Jerry, Dix Jensen	Utah School and Institutional Trust Lands	755	0.5	6	3	0.0
Dix Jensen	Utah School and Institutional Trust Lands	1,014	0.4	4	2	0.0
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	2.0	23	13	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	1.3	15	8	0.0
Nick Theos Family, LLP	Utah School and Institutional Trust Lands	3,376	2.8	32	19	0.0
Steven R. Pierson	Utah School and Institutional Trust Lands	1,297	1.2	13	8	0.0
State Total		22,484	13.3	154	89	0.0
Grand Total		580,150	95.3	1,105	639	0.0
Route Variation COUT-B-1						
Artesia	BLM White River Field Office	48,931	9.3	108	63	0.0
Massadona	BLM White River Field Office	10,871	3.6	42	25	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	23	13	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	8	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	83	49	0.0
Antelope Draw	BLM Vernal Field Office	55,904	9.0	104	61	0.0
Bohemian Bottoms	BLM Vernal Field Office	11,544	4.2	48	28	0.0
Ouray Road	BLM Vernal Field Office	11,961	4.3	49	29	0.0
Powder Wash	BLM Vernal Field Office	26,783	6.5	75	44	0.0
Snake John	BLM Vernal Field Office	10,680	3.9	45	26	0.0
Split Mountain	BLM Vernal Field Office	120,800	9.2	106	62	0.0
Twelve Mile	BLM Vernal Field Office	32,190	4.7	54	32	0.0
Kyune I	BLM Price Field Office	14,506	0.2	3	1	0.0
Kyune I	BLM Price Field Office	14,506	4.7	54	32	0.0
West Fork	BLM Price Field Office	16,706	6.2	71	42	0.0
ISO Tract - Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		403,205	75.8	879	516	0.0
Avintaquin	Ashley National Forest	9,219	0.1	2	1	0.0
Horse Ridge	Ashley National Forest	17,746	0.3	4	2	0.0

**TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES**

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Sowers Canyon	Ashley National Forest	20,986	12.0	139	82	0.0
Tub Ridge	Ashley National Forest	5,604	0.4	5	3	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	7	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	8	4	0.0
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	2.0	24	14	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	1.9	21	13	0.0
Tabbyune	Uinta-Wasatch-Cache National Forest	8,733	1.1	13	8	0.0
USFS Total⁵		200,768	19.5	227	133	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	14	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	7	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	1.0	11	7	0.0
Chew Livestock, Inc.	Utah School and Institutional Trust Lands	1,281	0.2	3	1	0.0
George Lowe Children	Utah School and Institutional Trust Lands	950	1.1	12	7	0.0
J. D. Jackson	Utah School and Institutional Trust Lands	164	0.2	2	1	0.0
James, Jerry, Dix Jensen	Utah School and Institutional Trust Lands	755	0.2	2	1	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	0.3	3	2	0.0
Nick Theos Family, LLP	Utah School and Institutional Trust Lands	3,376	2.8	32	19	0.0
Steven R. Pierson	Utah School and Institutional Trust Lands	1,297	1.2	13	8	0.0
State Total		18,495	9.9	114	67	0.0
Grand Total		610,306	96.6	1,121	657	0.0
Route Variation COUT-B-2						
Artesia	BLM White River Field Office	48,931	9.3	108	63	0.0
Massadona	BLM White River Field Office	10,871	3.6	42	25	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	23	13	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	8	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	83	49	0.0
Antelope Draw	BLM Vernal Field Office	55,904	9.0	104	61	0.0
Bohemian Bottoms	BLM Vernal Field Office	11,544	4.2	48	28	0.0
Ouray Road	BLM Vernal Field Office	11,961	4.3	49	29	0.0
Powder Wash	BLM Vernal Field Office	26,783	6.5	75	44	0.0
Snake John	BLM Vernal Field Office	10,680	3.9	45	26	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Split Mountain	BLM Vernal Field Office	120,800	9.2	106	62	0.0
Twelve Mile	BLM Vernal Field Office	32,190	4.7	54	32	0.0
Kyune I	BLM Price Field Office	14,506	5.1	60	35	0.0
West Fork	BLM Price Field Office	16,706	5.9	68	40	0.0
ISO Tract–Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		403,205	75.8	879	515	0.0
Avintaquin	Ashley National Forest	9,219	0.1	2	1	0.0
Horse Ridge	Ashley National Forest	17,746	0.3	4	2	0.0
Sowers Canyon	Ashley National Forest	20,986	12.0	139	82	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	7	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	8	4	0.0
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	2.0	24	14	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	1.9	21	13	0.0
Tabbyune	Uinta-Wasatch-Cache National Forest	8,733	1.1	13	8	0.0
USFS Total⁵		195,163	19.1	222	130	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	14	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	7	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	1.0	11	7	0.0
Chew Livestock, Inc.	Utah School and Institutional Trust Lands	1,281	0.2	3	1	0.0
George Lowe Children	Utah School and Institutional Trust Lands	950	1.1	12	7	0.0
J. D. Jackson	Utah School and Institutional Trust Lands	164	0.2	2	1	0.0
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	1.3	15	9	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	1.1	13	7	0.0
Nick Theos Family, LLP	Utah School and Institutional Trust Lands	3,376	2.8	32	19	0.0
Steven R. Pierson	Utah School and Institutional Trust Lands	1,297	1.2	13	8	0.0
William Marsing Livestock, Inc.	Utah School and Institutional Trust Lands	2,898	0.9	10	6	0.0
State Total		23,778	12.7	147	86	0.0
Grand Total		610,502	98.1	1,138	667	0.0
Route Variation COUT-B-3						
Artesia	BLM White River Field Office	48,931	9.3	108	63	0.0
Massadona	BLM White River Field Office	10,871	3.6	42	25	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Miller Creek	BLM White River Field Office	4,003	2.0	23	13	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	8	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	83	49	0.0
Antelope Draw	BLM Vernal Field Office	55,904	9.0	104	61	0.0
Bohemian Bottoms	BLM Vernal Field Office	11,544	4.2	48	28	0.0
Ouray Road	BLM Vernal Field Office	11,961	4.3	49	29	0.0
Powder Wash	BLM Vernal Field Office	26,783	6.5	75	44	0.0
Snake John	BLM Vernal Field Office	10,680	3.9	45	26	0.0
Split Mountain	BLM Vernal Field Office	120,800	9.2	106	62	0.0
Twelve Mile	BLM Vernal Field Office	32,190	4.7	54	32	0.0
Kyune I	BLM Price Field Office	14,506	6.2	72	42	0.0
West Fork	BLM Price Field Office	16,706	5.0	58	34	0.0
ISO Tract–Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		403,205	76.0	881	517	0.0
Sowers Canyon	Ashley National Forest	20,986	12.0	139	82	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	7	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	8	4	0.0
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	2.0	24	14	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	1.9	21	13	0.0
USFS Total⁵		159,473	17.5	203	119	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	14	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	7	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	1.0	11	7	0.0
Chew Livestock, Inc.	Utah School and Institutional Trust Lands	1,281	0.2	3	1	0.0
George Lowe Children	Utah School and Institutional Trust Lands	950	1.1	12	7	0.0
J. D. Jackson	Utah School and Institutional Trust Lands	164	0.2	2	1	0.0
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	1.1	12	7	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	1.1	13	7	0.0
Nick Theos Family, LLP	Utah School and Institutional Trust Lands	3,376	2.8	32	19	0.0
Steven R. Pierson	Utah School and Institutional Trust Lands	1,297	1.2	13	8	0.0
William Marsing Livestock, Inc.	Utah School and Institutional Trust Lands	2,898	0.3	3	2	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
State Total		23,778	11.8	137	80	0.0
Grand Total		574,815	95.9	1,112	652	0.0
Route Variation COUT-B-4						
Artesia	BLM White River Field Office	48,931	9.3	108	63	0.0
Massadona	BLM White River Field Office	10,871	3.6	42	25	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	23	13	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	8	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	83	49	0.0
Antelope Draw	BLM Vernal Field Office	55,904	9.0	104	61	0.0
Bohemian Bottoms	BLM Vernal Field Office	11,544	4.2	48	28	0.0
Ouray Road	BLM Vernal Field Office	11,961	4.3	49	29	0.0
Powder Wash	BLM Vernal Field Office	26,783	6.5	75	44	0.0
Snake John	BLM Vernal Field Office	10,680	3.9	45	26	0.0
Split Mountain	BLM Vernal Field Office	120,800	9.2	106	62	0.0
Twelve Mile	BLM Vernal Field Office	32,190	4.7	54	32	0.0
Kyune I	BLM Price Field Office	14,506	5.1	60	35	0.0
West Fork	BLM Price Field Office	16,706	5.9	68	40	0.0
ISO Tract–Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		403,205	75.8	879	515	0.0
Avintaquin	Ashley National Forest	9,219	0.1	2	1	0.0
Horse Ridge	Ashley National Forest	17,746	0.3	4	2	0.0
Sowers Canyon	Ashley National Forest	20,986	12.0	139	82	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	7	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	8	4	0.0
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	2.0	24	14	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	1.9	21	13	0.0
Tabbyune	Uinta-Wasatch-Cache National Forest	8,733	1.1	13	8	0.0
USFS Total⁵		195,163	19.1	222	130	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	14	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	7	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	1.0	11	7	0.0

**TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES**

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Chew Livestock, Inc.	Utah School and Institutional Trust Lands	1,281	0.2	3	1	0.0
George Lowe Children	Utah School and Institutional Trust Lands	950	1.1	12	7	0.0
J. D. Jackson	Utah School and Institutional Trust Lands	164	0.2	2	1	0.0
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	1.1	12	7	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	1.1	13	7	0.0
Nick Theos Family, LLP	Utah School and Institutional Trust Lands	3,376	2.8	32	19	0.0
Steven R. Pierson	Utah School and Institutional Trust Lands	1,297	1.2	13	8	0.0
William Marsing Livestock, Inc.	Utah School and Institutional Trust Lands	2,898	0.3	3	2	0.0
State Total		23,778	11.8	137	80	0.0
Grand Total		610,502	97.2	1,128	661	0.0
Route Variation COUT-B-5						
Artesia	BLM White River Field Office	48,931	9.3	107	68	0.0
Massadona	BLM White River Field Office	10,871	3.6	42	26	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	22	14	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	8	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	82	52	0.0
Antelope Draw	BLM Vernal Field Office	55,904	9.0	103	65	0.0
Bohemian Bottoms	BLM Vernal Field Office	11,544	4.2	48	30	0.0
Ouray Road	BLM Vernal Field Office	11,961	4.3	49	31	0.0
Powder Wash	BLM Vernal Field Office	26,783	6.5	74	47	0.0
Snake John	BLM Vernal Field Office	10,680	3.9	44	28	0.0
Split Mountain	BLM Vernal Field Office	120,800	9.2	105	67	0.0
Twelve Mile	BLM Vernal Field Office	32,190	4.7	54	34	0.0
Kyune I	BLM Price Field Office	14,506	6.2	72	45	0.0
West Fork	BLM Price Field Office	16,706	5.0	58	37	0.0
ISO Tract–Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		403,205	76.0	874	555	0.0
Sowers Canyon	Ashley National Forest	20,986	12.0	138	88	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	7	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	7	5	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	2.0	23	15	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	1.9	21	14	0.0
USFS Total⁵		159,473	17.5	201	128	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	15	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	7	0.0
Oscar S. Wyatt ,Jr.	Colorado State Land Board	641	1.0	11	7	0.0
Chew Livestock, Inc.	Utah School and Institutional Trust Lands	1,281	0.2	3	2	0.0
George Lowe Children	Utah School and Institutional Trust Lands	950	1.1	12	8	0.0
J. D. Jackson	Utah School and Institutional Trust Lands	164	0.2	2	1	0.0
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	1.3	15	10	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	1.1	13	8	0.0
Nick Theos Family, LLP	Utah School and Institutional Trust Lands	3,376	2.8	32	20	0.0
Steven R. Pierson	Utah School and Institutional Trust Lands	1,297	1.2	13	8	0.0
William Marsing Livestock, Inc.	Utah School and Institutional Trust Lands	2,898	0.9	10	6	0.0
State Total		23,778	12.7	146	93	0.0
Grand Total		574,815	96.8	1,113	707	0.0
Alternative COUT-C						
Artesia	BLM White River Field Office	48,931	11.0	125	84	0.0
Massadona	BLM White River Field Office	10,871	3.6	41	28	0.0
Miller Creekeek	BLM White River Field Office	4,003	2.0	22	15	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	9	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	82	55	0.0
Antelope Draw	BLM Vernal Field Office	55,904	3.1	35	24	0.0
Argyle Ridge	BLM Vernal Field Office	20,709	2.6	29	20	0.0
Big Wash	BLM Vernal Field Office	5,367	2.2	25	17	0.0
Bonanza	BLM Vernal Field Office	28,238	4.7	53	36	0.0
Castle Peak	BLM Vernal Field Office	51,824	3.7	43	29	0.0
Coyote Wash	BLM Vernal Field Office	107,988	9.0	102	69	0.0
Currant Canyon	BLM Vernal Field Office	6,975	0.7	8	5	0.0
Devils Canyon	BLM Vernal Field Office	22,351	0.9	10	7	0.0
Five Mile	BLM Vernal Field Office	15,622	4.9	56	38	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Green River Amp	BLM Vernal Field Office	9,608	0.2	2	1	0.0
Green River Bottoms	BLM Vernal Field Office	7,159	0.7	8	5	0.0
Lears Canyon	BLM Vernal Field Office	10,708	1.9	22	15	0.0
Little Desert	BLM Vernal Field Office	49,361	14.1	160	108	0.0
Olsen Amp	BLM Vernal Field Office	133,987	1.6	18	12	0.0
Parleys Canyon	BLM Vernal Field Office	16,341	7.1	81	55	0.0
Raven Ridge	BLM Vernal Field Office	10,985	3.8	43	29	0.0
Sand Wash	BLM Vernal Field Office	74,352	9.0	103	70	0.0
Seven Sisters	BLM Vernal Field Office	18,787	4.7	53	36	0.0
Snake John	BLM Vernal Field Office	10,680	0.6	6	4	0.0
Water Canyon #2	BLM Vernal Field Office	6,698	1.8	21	14	0.0
White River Bottoms	BLM Vernal Field Office	2,529	0.1	1	1	0.0
Wildhorse Bench	BLM Vernal Field Office	43,562	7.1	81	55	0.0
Kyune I	BLM Price Field Office	14,506	4.4	50	34	0.0
Price Canyon–West	BLM Price Field Office	7,428	0.9	10	7	0.0
Sulfur Canyon	BLM Price Field Office	10,941	2.9	33	22	0.0
West Field Office, RK	BLM Price Field Office	16,706	4.8	54	37	0.0
ISO Tract–Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		861,446	122.1	1,392	940	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	7	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	7	5	0.0
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	2.0	23	16	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	1.9	21	14	0.0
USFS Total⁵		138,487	5.5	63	42	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	16	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	8	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	0.8	9	6	0.0
Bill Barrett Corporation	Utah School and Institutional Trust Lands	2,075	1.1	13	9	0.0
Farmland Reserve, Inc.	Utah School and Institutional Trust Lands	1,956	1.2	13	9	0.0
James, Jerry, Dix Jensen	Utah School and Institutional Trust Lands	755	0.5	6	4	0.0
Dix Jensen	Utah School and Institutional Trust Lands	1,014	0.4	4	3	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	0.7	8	5	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	1.3	14	10	0.0
Kenneth A. Moon	Utah School and Institutional Trust Lands	482	1.0	11	8	0.0
Kirk A. Shiner	Utah School and Institutional Trust Lands	1,765	1.0	12	8	0.0
Lazy 3X Cattle, LLC	Utah School and Institutional Trust Lands	8,860	5.9	67	45	0.0
Michael Carlson	Utah School and Institutional Trust Lands	1,858	0.6	6	4	0.0
William R. Robinson	Utah School and Institutional Trust Lands	627	1.0	12	8	0.0
State Total		33,203	18.4	209	141	0.0
Grand Total		1,012,329	129.5	1,476	997	0.0
Route Variation COUT-C-1						
Artesia	BLM White River Field Office	48,931	11.0	126	86	0.0
Massadona	BLM White River Field Office	10,871	3.6	42	28	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	22	15	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	9	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	82	56	0.0
Antelope Draw	BLM Vernal Field Office	55,904	3.1	35	24	0.0
Argyle Ridge	BLM Vernal Field Office	20,709	6.5	75	51	0.0
Big Wash	BLM Vernal Field Office	5,367	2.2	25	17	0.0
Bonanza	BLM Vernal Field Office	28,238	4.7	53	36	0.0
Castle Peak	BLM Vernal Field Office	51,824	3.7	43	29	0.0
Coyote Wash	BLM Vernal Field Office	107,988	9.0	103	70	0.0
Currant Canyon	BLM Vernal Field Office	6,975	0.7	8	5	0.0
Devils Canyon	BLM Vernal Field Office	22,351	0.9	10	7	0.0
Five Mile	BLM Vernal Field Office	15,622	4.9	57	39	0.0
Green River Amp	BLM Vernal Field Office	9,608	0.2	2	1	0.0
Green River Bottoms	BLM Vernal Field Office	7,159	0.7	8	5	0.0
Lears Canyon	BLM Vernal Field Office	10,708	1.9	22	15	0.0
Little Desert	BLM Vernal Field Office	49,361	14.1	162	110	0.0
Olsen Amp	BLM Vernal Field Office	133,987	1.6	18	12	0.0
Parleys Canyon	BLM Vernal Field Office	16,341	7.1	82	55	0.0
Raven Ridge	BLM Vernal Field Office	10,985	3.8	43	29	0.0
Sand Wash	BLM Vernal Field Office	74,352	9.0	104	70	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Seven Sisters	BLM Vernal Field Office	18,787	4.7	54	37	0.0
Snake John	BLM Vernal Field Office	10,680	0.6	6	4	0.0
Water Canyon #1	BLM Vernal Field Office	5,121	1.9	21	15	0.0
Water Canyon #2	BLM Vernal Field Office	6,698	1.8	21	14	0.0
White River Bottoms	BLM Vernal Field Office	2,529	0.1	1	1	0.0
Wildhorse Bench	BLM Vernal Field Office	43,562	7.1	81	55	0.0
Kyune I	BLM Price Field Office	14,506	4.9	56	38	0.0
Sulfur Canyon	BLM Price Field Office	10,941	1.5	17	11	0.0
West Fork	BLM Price Field Office	16,706	6.2	71	48	0.0
ISO Tract - Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		859,139	127.5	1,466	994	0.0
Avintaquin	Ashley National Forest	9,219	0.1	2	1	0.0
Horse Ridge	Ashley National Forest	17,746	0.3	4	3	0.0
Tub Ridge	Ashley National Forest	5,604	0.4	5	3	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	8	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	7	5	0.0
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	2.0	23	16	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	1.9	21	14	0.0
Tabbyune	Uinta-Wasatch-Cache National Forest	8,733	1.1	13	9	0.0
USFS Total⁵		179,782	7.5	87	59	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	16	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	8	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	0.8	9	6	0.0
Bill Barrett Corporation	Utah School and Institutional Trust Lands	2,075	1.1	13	9	0.0
George Lowe Children	Utah School and Institutional Trust Lands	950	0.5	6	4	0.0
J. D. Jackson	Utah School and Institutional Trust Lands	164	0.2	2	1	0.0
James, Jerry, Dix Jensen	Utah School and Institutional Trust Lands	755	0.2	2	1	0.0
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	0.5	6	4	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	0.3	3	2	0.0
Kenneth A. Moon	Utah School and Institutional Trust Lands	482	1.0	12	8	0.0
Kirk A. Shiner	Utah School and Institutional Trust Lands	1,765	1.0	12	8	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Lazy 3X Cattle, LLC	Utah School and Institutional Trust Lands	8,860	5.9	68	46	0.0
Michael Carlson	Utah School and Institutional Trust Lands	1,858	0.6	6	4	0.0
William R. Robinson	Utah School and Institutional Trust Lands	627	1.0	12	8	0.0
State Total		31,347	16.0	184	125	0.0
Grand Total		1,049,680	136.1	1,565	1,062	0.0
Route Variation COUT-C-2						
Artesia	BLM White River Field Office	48,931	11.0	126	86	0.0
Massadona	BLM White River Field Office	10,871	3.6	42	28	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	22	15	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	9	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	82	56	0.0
Antelope Draw	BLM Vernal Field Office	55,904	3.1	35	24	0.0
Argyle Ridge	BLM Vernal Field Office	20,709	6.5	75	51	0.0
Big Wash	BLM Vernal Field Office	5,367	2.2	25	17	0.0
Bonanza	BLM Vernal Field Office	28,238	4.7	53	36	0.0
Castle Peak	BLM Vernal Field Office	51,824	3.7	43	29	0.0
Coyote Wash	BLM Vernal Field Office	107,988	9.0	103	70	0.0
Currant Canyon	BLM Vernal Field Office	6,975	0.7	8	5	0.0
Devils Canyon	BLM Vernal Field Office	22,351	0.9	10	7	0.0
Five Mile	BLM Vernal Field Office	15,622	4.9	57	39	0.0
Green River Amp	BLM Vernal Field Office	9,608	0.2	2	1	0.0
Green River Bottoms	BLM Vernal Field Office	7,159	0.7	8	5	0.0
Lears Canyon	BLM Vernal Field Office	10,708	1.9	22	15	0.0
Little Desert	BLM Vernal Field Office	49,361	14.1	162	110	0.0
Olsen Amp	BLM Vernal Field Office	133,987	1.6	18	12	0.0
Parleys Canyon	BLM Vernal Field Office	16,341	7.1	82	55	0.0
Raven Ridge	BLM Vernal Field Office	10,985	3.8	43	29	0.0
Sand Wash	BLM Vernal Field Office	74,352	9.0	104	70	0.0
Seven Sisters	BLM Vernal Field Office	18,787	4.7	54	37	0.0
Snake John	BLM Vernal Field Office	10,680	0.6	6	4	0.0
Water Canyon #1	BLM Vernal Field Office	5,121	1.9	21	15	0.0
Water Canyon #2	BLM Vernal Field Office	6,698	1.8	21	14	0.0

**TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES**

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
White River Bottoms	BLM Vernal Field Office	2,529	0.1	1	1	0.0
Wildhorse Bench	BLM Vernal Field Office	43,562	7.1	81	55	0.0
Kyune I	BLM Price Field Office	14,506	5.1	59	40	0.0
Sulfur Canyon	BLM Price Field Office	10,941	1.5	17	11	0.0
West Fork	BLM Price Field Office	16,706	5.9	68	46	0.0
ISO Tract–Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		859,139	127.4	1,465	994	0.0
Avintaquin	Ashley National Forest	9,219	0.1	2	1	0.0
Horse Ridge	Ashley National Forest	17,746	0.3	4	2	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	8	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	7	5	0.0
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	2.0	23	16	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	1.9	21	14	0.0
Tabbyune	Uinta-Wasatch-Cache National Forest	8,733	1.1	13	9	0.0
USFS Total⁵		174,177	7.1	82	55	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	16	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	8	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	0.8	9	6	0.0
Bill Barrett Corporation	Utah School and Institutional Trust Lands	2,075	1.1	13	9	0.0
George Lowe Children	Utah School and Institutional Trust Lands	950	0.5	6	4	0.0
J. D. Jackson	Utah School and Institutional Trust Lands	164	0.2	2	1	0.0
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	0.5	6	4	0.0
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	1.3	15	10	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	1.1	13	9	0.0
Kenneth A. Moon	Utah School and Institutional Trust Lands	482	1.0	12	8	0.0
Kirk A. Shiner	Utah School and Institutional Trust Lands	1,765	1.0	12	8	0.0
Lazy 3X Cattle, LLC	Utah School and Institutional Trust Lands	8,860	5.9	68	46	0.0
Michael Carlson	Utah School and Institutional Trust Lands	1,858	0.6	6	4	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
William Marsing Livestock, Inc.	Utah School and Institutional Trust Lands	2,898	0.9	10	7	0.0
William R. Robinson	Utah School and Institutional Trust Lands	627	1.0	12	8	0.0
State Total		33,491	18.8	217	147	0.0
Grand Total		1,046,797	137.7	1,584	1,074	0.0
Route Variation COUT-C-3 (Agency Preferred Alternative)						
Artesia	BLM White River Field Office	48,931	11.0	126	88	0.0
Massadona	BLM White River Field Office	10,871	3.6	42	29	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	22	16	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	9	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	82	57	0.0
Antelope Draw	BLM Vernal Field Office	55,904	3.1	35	25	0.0
Argyle Ridge	BLM Vernal Field Office	20,709	6.5	75	52	0.0
Big Wash	BLM Vernal Field Office	5,367	2.2	25	17	0.0
Bonanza	BLM Vernal Field Office	28,238	4.7	53	37	0.0
Castle Peak	BLM Vernal Field Office	51,824	3.7	43	30	0.0
Coyote Wash	BLM Vernal Field Office	107,988	9.0	103	72	0.0
Currant Canyon	BLM Vernal Field Office	6,975	0.7	8	6	0.0
Devils Canyon	BLM Vernal Field Office	22,351	0.9	10	7	0.0
Five Mile	BLM Vernal Field Office	15,622	4.9	57	40	0.0
Green River Amp	BLM Vernal Field Office	9,608	0.2	2	1	0.0
Green River Bottoms	BLM Vernal Field Office	7,159	0.7	8	5	0.0
Lears Canyon	BLM Vernal Field Office	10,708	1.9	22	15	0.0
Little Desert	BLM Vernal Field Office	49,361	14.1	162	112	0.0
Olsen Amp	BLM Vernal Field Office	133,987	1.6	18	13	0.0
Parleys Canyon	BLM Vernal Field Office	16,341	7.1	82	57	0.0
Raven Ridge	BLM Vernal Field Office	10,985	3.8	43	30	0.0
Sand Wash	BLM Vernal Field Office	74,352	9.0	104	72	0.0
Seven Sisters	BLM Vernal Field Office	18,787	4.7	54	38	0.0
Snake John	BLM Vernal Field Office	10,680	0.6	6	4	0.0
Water Canyon #1	BLM Vernal Field Office	5,121	1.9	21	15	0.0
Water Canyon #2	BLM Vernal Field Office	6,698	1.8	21	14	0.0
White River Bottoms	BLM Vernal Field Office	2,529	0.1	1	1	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Wildhorse Bench	BLM Vernal Field Office	43,562	7.1	81	57	0.0
Kyune I	BLM Price Field Office	14,506	6.2	72	50	0.0
Sulfur Canyon	BLM Price Field Office	10,941	1.5	17	12	0.0
West Field Office, RK	BLM Price Field Office	16,706	5.0	58	40	0.0
ISO Tract–Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		859,139	127.6	1,468	1,021	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	8	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	7	5	0.0
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	2.0	23	16	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	1.9	21	15	0.0
USFS Total⁵		138,487	5.5	63	44	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	16	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	8	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	0.8	9	6	0.0
Bill Barrett Corporation	Utah School and Institutional Trust Lands	2,075	1.1	13	9	0.0
George Lowe Children	Utah School and Institutional Trust Lands	950	0.5	6	4	0.0
J. D. Jackson	Utah School and Institutional Trust Lands	164	0.2	2	1	0.0
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	0.5	6	4	0.0
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	1.3	15	11	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	1.1	13	9	0.0
Kenneth A. Moon	Utah School and Institutional Trust Lands	482	1.0	12	8	0.0
Kirk A. Shiner	Utah School and Institutional Trust Lands	1,765	1.0	12	8	0.0
Lazy 3X Cattle, LLC	Utah School and Institutional Trust Lands	8,860	5.9	68	47	0.0
Michael Carlson	Utah School and Institutional Trust Lands	1,858	0.6	6	4	0.0
William Marsing Livestock, Inc.	Utah School and Institutional Trust Lands	2,898	0.9	10	7	0.0
William R. Robinson	Utah School and Institutional Trust Lands	627	1.0	12	8	0.0
State Total		33,491	18.8	217	151	0.0
Grand Total		1,011,110	136.3	1,567	1,090	0.0
Route Variation COUT-C-4						
Artesia	BLM White River Field Office	48,931	11.0	126	81	0.0
Massadona	BLM White River Field Office	10,871	3.6	42	27	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Miller Creek	BLM White River Field Office	4,003	2.0	22	14	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	8	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	82	53	0.0
Antelope Draw	BLM Vernal Field Office	55,904	3.1	35	23	0.0
Argyle Ridge	BLM Vernal Field Office	20,709	3.3	38	24	0.0
Big Wash	BLM Vernal Field Office	5,367	2.2	25	16	0.0
Bonanza	BLM Vernal Field Office	28,238	4.7	53	34	0.0
Castle Peak	BLM Vernal Field Office	51,824	3.7	43	28	0.0
Coyote Wash	BLM Vernal Field Office	107,988	9.0	103	67	0.0
Currant Canyon	BLM Vernal Field Office	6,975	0.7	8	5	0.0
Devils Canyon	BLM Vernal Field Office	22,351	0.9	10	7	0.0
Five Mile	BLM Vernal Field Office	15,622	4.9	57	37	0.0
Green River Amp	BLM Vernal Field Office	9,608	0.2	2	1	0.0
Green River Bottoms	BLM Vernal Field Office	7,159	0.7	8	5	0.0
Lears Canyon	BLM Vernal Field Office	10,708	1.9	22	14	0.0
Little Desert	BLM Vernal Field Office	49,361	14.1	162	104	0.0
Olsen Amp	BLM Vernal Field Office	133,987	1.6	18	12	0.0
Parleys Canyon	BLM Vernal Field Office	16,341	7.1	82	52	0.0
Raven Ridge	BLM Vernal Field Office	10,985	3.8	43	28	0.0
Sand Wash	BLM Vernal Field Office	74,352	9.0	104	67	0.0
Seven Sisters	BLM Vernal Field Office	18,787	4.7	54	35	0.0
Snake John	BLM Vernal Field Office	10,680	0.6	6	4	0.0
Water Canyon #1	BLM Vernal Field Office	5,121	3.3	38	24	0.0
Water Canyon #2	BLM Vernal Field Office	6,698	1.8	21	13	0.0
White River Bottoms	BLM Vernal Field Office	2,529	0.1	1	1	0.0
Wildhorse Bench	BLM Vernal Field Office	43,562	7.1	81	52	0.0
Kyune I	BLM Price Field Office	14,506	5.1	59	38	0.0
Sulfur Canyon	BLM Price Field Office	10,941	2.9	33	21	0.0
West Fork	BLM Price Field Office	16,706	5.9	68	44	0.0
ISO Tract - Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		859,139	127.0	1,461	940	0.0

**TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES**

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Avintaquin	Ashley National Forest	9,219	0.1	2	1	0.0
Horse Ridge	Ashley National Forest	17,746	0.3	4	2	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	7	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	7	5	0.0
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	2.0	23	15	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	1.9	21	14	0.0
Tabbyune	Uinta-Wasatch-Cache National Forest	8,733	1.1	13	8	0.0
USFS Total⁵		174,177	7.1	82	53	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	15	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	7	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	0.8	9	6	0.0
Bill Barrett Corporation	Utah School and Institutional Trust Lands	2,075	1.1	13	8	0.0
Farmland Reserve, Inc.	Utah School and Institutional Trust Lands	1,956	1.0	12	8	0.0
J. D. Jackson	Utah School and Institutional Trust Lands	164	0.2	2	1	0.0
Jacquelyn B. Oman	Utah School and Institutional Trust Lands	648	1.0	12	7	0.0
James Allen Staker	Utah School and Institutional Trust Lands	648	1.0	12	7	0.0
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	1.8	21	14	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	1.1	13	8	0.0
JTJJ Enterprises, Ltd.	Utah School and Institutional Trust Lands	605	1.0	12	8	0.0
Kenneth A. Moon	Utah School and Institutional Trust Lands	482	1.0	12	7	0.0
Kirk A. Shiner	Utah School and Institutional Trust Lands	1,765	1.0	12	8	0.0
Lazy 3X Cattle, LLC	Utah School and Institutional Trust Lands	8,860	5.9	68	44	0.0
Michael Carlson	Utah School and Institutional Trust Lands	1,858	0.6	6	4	0.0
William Marsing Livestock, Inc.	Utah School and Institutional Trust Lands	2,898	0.3	3	2	0.0
William R. Robinson	Utah School and Institutional Trust Lands	627	1.0	12	7	0.0
State Total		35,749	20.8	239	154	0.0
Grand Total		1,047,803	137.3	1,579	1,016	0.0
Route Variation COUT-C-5						
Artesia	BLM White River Field Office	48,931	11.0	126	81	0.0
Massadona	BLM White River Field Office	10,871	3.6	42	27	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	22	14	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Red Wash	BLM White River Field Office	8,219	1.1	13	8	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	82	53	0.0
Antelope Draw	BLM Vernal Field Office	55,904	3.1	35	23	0.0
Argyle Ridge	BLM Vernal Field Office	20,709	3.3	38	24	0.0
Big Wash	BLM Vernal Field Office	5,367	2.2	25	16	0.0
Bonanza	BLM Vernal Field Office	28,238	4.7	53	34	0.0
Castle Peak	BLM Vernal Field Office	51,824	3.7	43	28	0.0
Coyote Wash	BLM Vernal Field Office	107,988	9.0	103	67	0.0
Currant Canyon	BLM Vernal Field Office	6,975	0.7	8	5	0.0
Devils Canyon	BLM Vernal Field Office	22,351	0.9	10	7	0.0
Five Mile	BLM Vernal Field Office	15,622	4.9	57	37	0.0
Green River Amp	BLM Vernal Field Office	9,608	0.2	2	1	0.0
Green River Bottoms	BLM Vernal Field Office	7,159	0.7	8	5	0.0
Lears Canyon	BLM Vernal Field Office	10,708	1.9	22	14	0.0
Little Desert	BLM Vernal Field Office	49,361	14.1	162	104	0.0
Olsen Amp	BLM Vernal Field Office	133,987	1.6	18	12	0.0
Parleys Canyon	BLM Vernal Field Office	16,341	7.1	82	52	0.0
Raven Ridge	BLM Vernal Field Office	10,985	3.8	43	28	0.0
Sand Wash	BLM Vernal Field Office	74,352	9.0	104	67	0.0
Seven Sisters	BLM Vernal Field Office	18,787	4.7	54	35	0.0
Snake John	BLM Vernal Field Office	10,680	0.6	6	4	0.0
Water Canyon #1	BLM Vernal Field Office	5,121	3.3	38	24	0.0
Water Canyon #2	BLM Vernal Field Office	6,698	1.8	21	13	0.0
White River Bottoms	BLM Vernal Field Office	2,529	0.1	1	1	0.0
Wildhorse Bench	BLM Vernal Field Office	43,562	7.1	81	52	0.0
Kyune I	BLM Price Field Office	14,506	6.2	72	46	0.0
Sulfur Canyon	BLM Price Field Office	10,941	2.9	33	21	0.0
West Fork	BLM Price Field Office	16,706	5.0	58	37	0.0
ISO Tract–Ludlow	BLM Salt Lake Field Office	461	0.1	1	1	0.0
BLM Total		859,139	127.3	1,464	942	0.0
Cedar Knolls S & G	Manti-La Sal National Forest	5,718	1.0	11	7	0.0
Lake Fork C & H	Manti-La Sal National Forest	30,399	0.7	7	5	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Diamond Fork	Uinta-Wasatch-Cache National Forest	90,743	2.0	23	15	0.0
Jacob/Baldy	Uinta-Wasatch-Cache National Forest	11,628	1.9	21	14	0.0
USFS Total⁵		138,487	5.5	63	41	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	15	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	7	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	0.8	9	6	0.0
Bill Barrett Corporation	Utah School and Institutional Trust Lands	2,075	1.1	13	8	0.0
Farmland Reserve, Inc.	Utah School and Institutional Trust Lands	1,956	1.0	12	8	0.0
J. D. Jackson	Utah School and Institutional Trust Lands	164	0.2	2	1	0.0
Jacquelyn B. Oman	Utah School and Institutional Trust Lands	648	1.0	12	7	0.0
James Allen Staker	Utah School and Institutional Trust Lands	648	1.0	12	7	0.0
Farris A. Jensen	Utah School and Institutional Trust Lands	3,140	1.8	21	14	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	1.1	13	8	0.0
JTJJ Enterprises, Ltd.	Utah School and Institutional Trust Lands	605	1.0	12	8	0.0
Kenneth A. Moon	Utah School and Institutional Trust Lands	482	1.0	12	7	0.0
Kirk A. Shiner	Utah School and Institutional Trust Lands	1,765	1.0	12	8	0.0
Lazy 3X Cattle, LLC	Utah School and Institutional Trust Lands	8,860	5.9	68	44	0.0
Michael Carlson	Utah School and Institutional Trust Lands	1,858	0.6	6	4	0.0
William Marsing Livestock, Inc.	Utah School and Institutional Trust Lands	2,898	0.3	3	2	0.0
William R. Robinson	Utah School and Institutional Trust Lands	627	1.0	12	7	0.0
State Total		35,749	20.8	239	154	0.0
Grand Total		1,012,115	135.9	1,563	1,006	0.0
Alternative COUT-H (Applicant Preferred Alternative)						
Artesia	BLM White River Field Office	48,931	11.0	125	77	0.0
Massadona	BLM White River Field Office	10,871	3.6	41	25	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	22	14	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	8	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	82	50	0.0
Antelope Draw	BLM Vernal Field Office	55,904	3.1	35	22	0.0
Argyle Ridge	BLM Vernal Field Office	20,709	2.6	29	18	0.0
Big Wash	BLM Vernal Field Office	5,367	2.2	25	15	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Bonanza	BLM Vernal Field Office	28,238	4.7	53	33	0.0
Castle Peak	BLM Vernal Field Office	51,824	3.7	43	26	0.0
Coyote Wash	BLM Vernal Field Office	107,988	9.0	102	63	0.0
Currant Canyon	BLM Vernal Field Office	6,975	0.7	8	5	0.0
Devils Canyon	BLM Vernal Field Office	22,351	0.9	10	6	0.0
Five Mile	BLM Vernal Field Office	15,622	4.9	56	35	0.0
Green River Amp	BLM Vernal Field Office	9,608	0.2	2	1	0.0
Green River Bottoms	BLM Vernal Field Office	7,159	0.7	8	5	0.0
Lears Canyon	BLM Vernal Field Office	10,708	1.9	22	14	0.0
Little Desert	BLM Vernal Field Office	49,361	14.1	160	98	0.0
Olsen Amp	BLM Vernal Field Office	133,987	1.6	18	11	0.0
Parleys Canyon	BLM Vernal Field Office	16,341	7.1	81	50	0.0
Raven Ridge	BLM Vernal Field Office	10,985	3.8	43	26	0.0
Sand Wash	BLM Vernal Field Office	74,352	9.0	103	63	0.0
Seven Sisters	BLM Vernal Field Office	18,787	4.7	53	33	0.0
Snake John	BLM Vernal Field Office	10,680	0.6	6	4	0.0
Water Canyon #2	BLM Vernal Field Office	6,698	1.8	21	13	0.0
White River Bottoms	BLM Vernal Field Office	2,529	0.1	1	1	0.0
Wildhorse Bench	BLM Vernal Field Office	43,562	7.1	81	50	0.0
Consumers Wash	BLM Price Field Office	10,723	4.9	56	34	0.0
Gordon Creek Withdrawal	BLM Price Field Office	21,837	5.2	59	36	0.0
Sulfur Canyon	BLM Price Field Office	10,941	2.9	33	20	0.0
Trail Canyon	BLM Price Field Office	5,860	3.8	43	26	0.0
Willow Creek	BLM Price Field Office	15,025	6.1	69	42	0.0
Hop Creek	BLM Richfield Field Office	2,566	1.3	14	9	0.0
Uinta	BLM Richfield Field Office	1,028	1.2	13	8	0.0
BLM Total		879,383	134.2	1,530	940	0.0
Beaver Dams/Boulger	Manti-La Sal National Forest	4,801	0.7	8	5	0.0
Burnout	Manti-La Sal National Forest	4,254	3.0	35	21	0.0
Gooseberry–Cottonwood	Manti-La Sal National Forest	4,668	2.8	32	20	0.0
Private Land	Manti-La Sal National Forest	6,491	2.1	24	15	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Private Land Permit	Manti-La Sal National Forest	9,053	1.4	16	10	0.0
Swens Canyon	Manti-La Sal National Forest	2,072	1.2	14	8	0.0
USFS Total		31,339	11.3	129	79	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	14	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	7	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	0.8	9	5	0.0
Bill Barrett Corporation	Utah School and Institutional Trust Lands	2,075	1.1	13	8	0.0
Farmland Reserve, Inc.	Utah School and Institutional Trust Lands	1,956	1.2	13	8	0.0
James T. Jensen	Utah School and Institutional Trust Lands	5,555	0.0	0	0	0.0
Kenneth A. Moon	Utah School and Institutional Trust Lands	482	1.0	11	7	0.0
Kirk A. Shiner	Utah School and Institutional Trust Lands	1,765	1.0	12	7	0.0
Lazy 3X Cattle, LLC	Utah School and Institutional Trust Lands	8,860	5.9	67	41	0.0
Michael Carlson	Utah School and Institutional Trust Lands	1,858	0.6	6	4	0.0
Pete Stamatakis	Utah School and Institutional Trust Lands	2,252	2.1	24	15	0.0
Steve Stamatakis	Utah School and Institutional Trust Lands	2,252	2.1	24	15	0.0
William R. Robinson	Utah School and Institutional Trust Lands	627	1.0	12	7	0.0
State Total		30,546	17.7	202	124	0.0
Grand Total		922,312	146.7	1,672	1,027	0.0
Alternative COUT-I						
Artesia	BLM White River Field Office	48,931	11.0	125	73	0.0
Massadona	BLM White River Field Office	10,871	3.6	41	24	0.0
Miller Creek	BLM White River Field Office	4,003	2.0	22	13	0.0
Red Wash	BLM White River Field Office	8,219	1.1	13	7	0.0
Spooky Mountain	BLM White River Field Office	29,666	7.2	82	48	0.0
Antelope Draw	BLM Vernal Field Office	55,904	3.1	35	21	0.0
Argyle Ridge	BLM Vernal Field Office	20,709	2.6	29	17	0.0
Big Wash	BLM Vernal Field Office	5,367	2.2	25	15	0.0
Bonanza	BLM Vernal Field Office	28,238	4.7	53	31	0.0
Castle Peak	BLM Vernal Field Office	51,824	3.7	43	25	0.0
Coyote Wash	BLM Vernal Field Office	107,988	9.0	102	60	0.0
Currant Canyon	BLM Vernal Field Office	6,975	0.7	8	5	0.0

TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Devils Canyon	BLM Vernal Field Office	22,351	0.9	10	6	0.0
Five Mile	BLM Vernal Field Office	15,622	4.9	56	33	0.0
Green River Amp	BLM Vernal Field Office	9,608	0.2	2	1	0.0
Green River Bottoms	BLM Vernal Field Office	7,159	0.7	8	4	0.0
Lears Canyon	BLM Vernal Field Office	10,708	1.9	22	13	0.0
Little Desert	BLM Vernal Field Office	49,361	14.1	160	94	0.0
Olsen Amp	BLM Vernal Field Office	133,987	1.6	18	11	0.0
Parleys Canyon	BLM Vernal Field Office	16,341	7.1	81	48	0.0
Raven Ridge	BLM Vernal Field Office	10,985	3.8	43	25	0.0
Sand Wash	BLM Vernal Field Office	74,352	9.0	103	61	0.0
Seven Sisters	BLM Vernal Field Office	18,787	4.7	53	31	0.0
Snake John	BLM Vernal Field Office	10,680	0.6	6	4	0.0
Water Canyon #2	BLM Vernal Field Office	6,698	1.8	21	12	0.0
White River Bottoms	BLM Vernal Field Office	2,529	0.1	1	1	0.0
Wildhorse Bench	BLM Vernal Field Office	43,562	7.1	81	47	0.0
Bench	BLM Price Field Office	1,366	2.2	25	15	0.0
Cat Canyon	BLM Price Field Office	2,204	3.4	39	23	0.0
Coal Creek	BLM Price Field Office	17,973	6.0	69	40	0.0
Corner	BLM Price Field Office	3,127	0.6	6	4	0.0
Mathis Wash	BLM Price Field Office	5,230	2.0	23	14	0.0
Mounds	BLM Price Field Office	23,077	0.6	7	4	0.0
North Olsen Lake	BLM Price Field Office	4,074	4.2	48	28	0.0
Oviatt	BLM Price Field Office	453	1.3	15	9	0.0
Poison Spring Bench	BLM Price Field Office	11,859	2.9	33	19	0.0
Soldiers Canyon	BLM Price Field Office	22,667	1.6	18	11	0.0
South Olsen Lake	BLM Price Field Office	1,897	2.7	31	18	0.0
Staker	BLM Price Field Office	679	0.8	9	5	0.0
Sulfur Canyon	BLM Price Field Office	10,941	2.9	33	19	0.0
Washboard	BLM Price Field Office	11,222	5.0	57	33	0.0
Wellington	BLM Price Field Office	328	0.4	4	2	0.0
West Huntington	BLM Price Field Office	17,384	3.2	36	21	0.0
Apple Spring	BLM Richfield Field Office	3,806	2.7	30	18	0.0

**TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES**

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Hop Creek	BLM Richfield Field Office	2,566	2.0	22	13	0.0
Indian Hollow	BLM Richfield Field Office	1,774	1.4	16	9	0.0
BLM Total		954,029	154.8	1,764	1,037	0.0
Booth Canyon	Manti-La Sal National Forest	2,671	0.9	11	6	0.0
East Mountain	Manti-La Sal National Forest	11,028	2.4	28	16	0.0
Gentry	Manti-La Sal National Forest	5,162	2.3	26	15	0.0
Joes Valley	Manti-La Sal National Forest	8,185	1.7	19	11	0.0
Out	Manti-La Sal National Forest	7,830	0.6	6	4	0.0
Potter Canyon	Manti-La Sal National Forest	2,577	2.7	31	18	0.0
Private Land Permit	Manti-La Sal National Forest	9,053	2.3	26	16	0.0
Skyline S & G	Manti-La Sal National Forest	8,011	2.0	23	14	0.0
South Skyline S & G	Manti-La Sal National Forest	11,683	0.4	4	3	0.0
Trail Mountain	Manti-La Sal National Forest	23,763	4.6	53	31	0.0
USFS Total		89,963	20.0	228	134	0.0
Cross Mountain Ranch Limited Partnership/Company	Colorado State Land Board	3,841	2.0	23	14	0.0
Jack V. Foster	Colorado State Land Board	641	1.0	12	7	0.0
Oscar S. Wyatt, Jr.	Colorado State Land Board	641	0.8	9	5	0.0
Anderson Brothers	Utah School and Institutional Trust Lands	568	1.1	12	7	0.0
Bill Fasselin	Utah School and Institutional Trust Lands	2,101	1.0	12	7	0.0
Bill Barrett Corporation	Utah School and Institutional Trust Lands	2,075	1.1	13	8	0.0
Cory Cloward	Utah School and Institutional Trust Lands	989	0.7	8	5	0.0
Courtney Guymon	Utah School and Institutional Trust Lands	13,117	5.9	67	39	0.0
Donna Lemmon	Utah School and Institutional Trust Lands	12,895	5.9	67	40	0.0
Earl and Sheila Gordon	Utah School and Institutional Trust Lands	12,870	5.8	66	39	0.0
Farmland Reserve, Inc.	Utah School and Institutional Trust Lands	1,956	1.4	16	9	0.0
Bill and Jennie Fasselin	Utah School and Institutional Trust Lands	3,583	1.7	19	11	0.0
Courtney Guymon	Utah School and Institutional Trust Lands	11,147	3.1	36	21	0.0
Hatch Livestock	Utah School and Institutional Trust Lands	26,095	9.4	107	63	0.0
Ira W. Hatch	Utah School and Institutional Trust Lands	13,117	5.9	67	39	0.0
Jordan W. Hatch	Utah School and Institutional Trust Lands	12,830	5.8	66	39	0.0
Keith A. Larsen	Utah School and Institutional Trust Lands	13,750	5.9	67	39	0.0

**TABLE G-3
GRAZING ALLOTMENTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40
TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES**

Allotment	Jurisdiction	Total Acres of Allotment	Miles Crossed	Acres of Temporary Disturbance¹	Acres of Permanent Disturbance²	Percent of Allotment Disturbed³
Kenneth A. Moon	Utah School and Institutional Trust Lands	482	1.0	11	7	0.0
Kirk A. Shiner	Utah School and Institutional Trust Lands	1,765	1.0	12	7	0.0
Lazy 3X Cattle, LLC	Utah School and Institutional Trust Lands	8,860	5.9	67	40	0.0
Lee McElprang	Utah School and Institutional Trust Lands	24,264	9.0	102	60	0.0
Leon McElprang	Utah School and Institutional Trust Lands	9,592	0.0	0	0	0.0
Leon McElprang	Utah School and Institutional Trust Lands	9,592	0.0	0	0	0.0
Leon McElprang	Utah School and Institutional Trust Lands	9,592	1.4	16	9	0.0
Leon McElprang	Utah School and Institutional Trust Lands	9,592	1.5	18	10	0.0
Linda M. Muth	Utah School and Institutional Trust Lands	6,208	3.1	35	21	0.0
Leon McElprang,	Utah School and Institutional Trust Lands	23,977	8.9	102	60	0.0
Thomas McElprang	Utah School and Institutional Trust Lands	9,946	2.9	33	19	0.0
Michael Carlson	Utah School and Institutional Trust Lands	1,858	0.6	6	4	0.0
The Earl and Sheila Gordon Trust	Utah School and Institutional Trust Lands	22,810	8.7	100	59	0.0
Sherrel Ward	Utah School and Institutional Trust Lands	13,117	5.9	67	39	0.0
William R. Robinson	Utah School and Institutional Trust Lands	627	1.0	12	7	0.0
State Total		64,261	33.0	376	221	0.0
Grand Total		1,070,971	183.7	2,094	1,231	0.0

NOTES:

The agency total allotment acreage and the miles crossed do not equal a sum of each agency's total allotment acreage or miles crossed, due to overlap of allotment boundaries. Also, the grand-total acreage and the miles crossed do not equal a sum of each agency's total allotment acreage or miles crossed due to overlap of allotment boundaries.

¹Temporary Disturbance: Estimated area of disturbance associated with structure work areas, wire pulling-and-tensioning sites, wire-splicing sites, multi-purpose construction yards, helicopter fly yards, guard structures, and temporary access roads (refer to Environmental Impact Statement [EIS] Table 2-1).

²Permanent Disturbance: Estimated area of disturbance associated with the area occupied by structures (pads), communication regeneration stations, substations and series compensation stations, and permanent access roads (refer to EIS Table 2-2).

³All percentages of allotments disturbed are less than 0.1 percent. Due to rounding, the percentages are shown as 0.0 percent.

⁴For the BLM White River Field Office, the unit called "Unallotted" has not been included in the numbers above.

⁵The unit in Uinta–Wasatch–Cache National Forest called "Watershed Closure" has not been included in the numbers above.

BLM = Bureau of Land Management

USFS = U.S. Forest Service

APPENDIX H – VISUAL RESOURCES SUPPORTING DATA

Information in this appendix was compiled to support the discussion of visual resources in Chapter 3 and Chapter 4. Included as aids are photographs representing selected project-level scenery rating units, a table listing the agency-approved key observation points (KOPs), contrast rating worksheets from each KOP location, and associated visual simulations. Further information regarding the development of the Energy Gateway South Transmission Project's (Project) visual resource assessment including methods and results is provided in the Project's Visual Resource Technical Report.

As described in Section 3.2.16.4, project-level scenery rating units were developed within a 6-mile-wide corridor centered on the reference centerlines across all jurisdictions (visual resource study corridor). To aid the reader in understanding the scenery crossed by the Project, photographs representing selected project-level scenery rating units have been included in this appendix (Exhibit H1). The selected scenery rating units include typical landscapes representing Class A, Class B, and Class C landscapes (as applicable) in each state as well as key landscapes described in Section 3.2.16. For a complete set of project-level scenery rating unit worksheets, including representative photographs, please refer to the Project's Visual Resource Technical Report.

To comply with *BLM Manual Section 8400 – Visual Resource Management*, in particular Visual Resource Management (VRM) Handbook 8431-1, contrast rating worksheets were developed from each agency-approved KOP location. To maintain consistency across all jurisdictions crossed by the Project, contrast rating worksheets were completed for Bureau of Land Management (BLM), U.S. Forest Service (USFS), tribal, and state-administered lands as well as from private lands. These contrast rating worksheets were used to verify the impact model, document visual contrast resulting from the Project, and identify areas where the Project would not meet the definition of the federal agency visual management objective (BLM VRM Objectives or USFS Visual Quality Objectives [VQO]), which may require an amendment to the applicable agency management plan (BLM resource management plan [RMP] or USFS land and resource management plan [LRMP], referred to in this document as land-use plan amendments).

A total of 145 KOPs were identified for analysis and are listed in Table H-1 (Exhibit H2). The table includes nine components for each KOP:

1. KOP identification number,
2. KOP name (viewing location name),
3. concern level factors (viewing duration, volume of use, concern for aesthetics, scenic or historic status, type of use, and overall concern level),
4. the associated Project link number(s),
5. whether the view is from BLM- or USFS-administered lands, view of BLM- or USFS-administered lands, or would both be located on and view non-federally administered lands (e.g., state-administered lands and private lands),
6. whether the KOP is of national significance,
7. whether a visual simulation was identified,
8. approximate distance from the Project, and
9. a brief rationale describing why each KOP was selected.

Please note, the concern levels identified for viewing locations not represented by a KOP can be found in the Project's Visual Resource Technical Report. Following the table, each KOP has a completed contrast rating worksheet (Exhibit H2) and where applicable, a visual simulation depicting the existing condition and simulated condition with the addition of the Project (Exhibit H3). Visual simulations were developed to demonstrate the potential impacts and associated contrast generated by the addition of the Project in a variety of landscape settings. A total of 47 simulations were prepared from 45 viewpoints throughout the Project area including views from residential areas, travel routes, recreation areas, and special designations. In addition, a total of 35 cumulative effect simulations were prepared from 33 viewpoints to present the cumulative effect associated with the incremental modification of views through the addition of the Project, TransWest Express Project, and/or the Energy Gateway West Project.

**Exhibit H1 –
Selected Project-level
Scenery Rating Unit Photographs**

Wyoming



Typical Class B Scenery



Typical Class C Scenery

Colorado



Typical Class B Scenery



Class B Scenery: Little Snake River



Class B Scenery: Tavaputs Plateau



Class B Scenery: Yampa River



Typical Class C Scenery

Utah



Class A Scenery: Argyle Canyon



Class A Scenery: Green River (Uinta Basin physiographic section)



Class A Scenery: Strawberry River



Class A Scenery: Wasatch Plateau Alpine



Class A Scenery: Wasatch Plateau Park



Typical Class B Scenery



Class B Scenery: Bad Land Cliffs



Class B Scenery: Book Cliffs



Class B Scenery: Wasatch Plateau



Typical Class C Scenery

**Exhibit H2 –
Key Observation Point
Contrast Rating Worksheets**

LIST OF ACRONYMS AND ABBREVIATIONS¹

Dr	Drive
FR	Forest Road
HWY	Highway
NF	National Forest
NHD	National Historic District
SB	Scenic Byway
SRMA	Special Recreation Management Area
WMA	Wildlife Management Area
WSA	Wilderness Study Area

Note: ¹These acronyms and abbreviations were used as needed, due to space limitations in the name field, on the visual contrast rating worksheets.

TABLE H-1 KEY OBSERVATION POINTS AND SIMULATION LOCATIONS															
KOP ID	Viewing Location Name	Concern Level Factors						Link(s)	Key Observation Point				Simulation ¹	Distance from Project	KOP or Simulation Selection Rationale
		Viewing Duration	Volume of Use	Concern for Aesthetics	Scenic or Historic Status	Type of Use	Overall Concern Level		View from BLM/USFS Administered Land)	View of BLM/USFS Administered Land)	Other	National Significance			
WYOMING															
Bureau of Land Management Rawlins Field Office															
73	Baggs residential	Long	Moderate	High		Residential	High	W300		✓				2.2 miles	Residential views of the Project through BLM VRM Class III land
177	Overland Trail historical monument (Wyoming Highway 789)	Long	Moderate	High	Historic	Recreation	High	W110		✓		✓		0.4 mile	View from Overland Trail ruts interpretive pull out (Wyoming Highway 789) of the Project through BLM VRM Class IV land
197	Hanna residential	Long	Moderate	High		Residential	High	W22			✓		✓	0.3 mile	Residential views
198	U.S. Highway 30 (east of Hanna)	Moderate	High	Moderate		Travel Route	Moderate	W22		✓				1.0 mile	Travel route views of the Project through BLM VRM Class IV land
220	North Platte River Special Recreation Management Area	Long	Moderate	High		Recreation	High	W30		✓			✓✓	0.5 mile	Special Recreation Management Area/North Platte River Crossing views of the Project through BLM VRM Class IV land
222	Hanna Draw Road	Moderate-Long	Low-Moderate	Moderate		Travel Route	Moderate	W21	✓					0.6 mile	Travel route/recreation access road views of the Project through BLM VRM Class IV land
224	U.S. Highway 30 (Walcott)	Moderate	High	Moderate		Travel Route	Moderate	W35	✓					1.0 mile	Travel route views of the Project through BLM VRM Class III land
225	Outlaw Trail Loop Scenic Drive (Wyoming Highway 789 north of Baggs)	Long	High	High	Scenic	Travel Route/Recreation	High	W111	✓				✓✓	0.1 mile	Long duration travel route view of the Project through BLM VRM Class IV land
226	Interstate 80 (east of Sinclair)	Short	High	Moderate		Travel Route	Moderate	W30	✓					0.3 mile	Travel route views of the Project through BLM VRM Class IV land
227	Wyoming Highway 71	Moderate	High	Moderate		Travel Route	Moderate	W30		✓				0.2 mile	Travel route views of the Project through BLM VRM Class IV land
228	Outlaw Trail Loop Scenic Drive (Wyoming Highway 789 south of Interstate-80)	Long	High	High	Scenic	Travel Route/Recreation	High	W32	✓					0.6 mile	Travel route views of the Project through BLM VRM Class IV land
229	Wamsutter residential	Long	Moderate	High		Residential	High	W102		✓				2.9 miles	Residential views of the Project through BLM VRM Class III and IV land
275	Overland Historic Trail	Long	Low	High	Historic	Recreation	High	W27		✓		✓		0.5 mile	Historic trail view of the Project through BLM VRM Class III land
276	Cherokee Historic Trail	Long	Low	High	Historic	Recreation	High	W409	✓			✓		0.7 mile	Historic trail view of the Project through BLM VRM Class III land
281	Rawlins to Baggs Historic Trail (Twenty Mile Road)	Long	Low	High	Historic	Recreation	High	W30	✓					0.5 mile	Historic trail view of the Project through BLM VRM Class IV land
286	Adobe Town Wilderness Study Area Destination Route (BLM Road 4411)	Moderate-Long	Moderate	Moderate		Travel Route	Moderate	W27	✓					6.5 miles	Travel route views of the Project through BLM VRM Class III land
295	Fort Fred Steele Historic Site	Long	Moderate-High	High	Historic	Recreation	High	W30		✓				2.3 miles	Historic site views of the Project through BLM VRM Class IV land

TABLE H-1 KEY OBSERVATION POINTS AND SIMULATION LOCATIONS															
KOP ID	Viewing Location Name	Concern Level Factors						Link(s)	Key Observation Point				Simulation ¹	Distance from Project	KOP or Simulation Selection Rationale
		Viewing Duration	Volume of Use	Concern for Aesthetics	Scenic or Historic Status	Type of Use	Overall Concern Level		View from BLM/USFS Administered Land)	View of BLM/USFS Administered Land)	Other	National Significance			
COLORADO															
Bureau of Land Management Little Snake Field Office															
50	Dispersed Maybell residential (Juniper Mountain)	Long	Low	High		Residential	High	C106		✓				1.0 mile	Dispersed residential views along the Yampa river of the Project through BLM VRM Class III land
51	Juniper Canyon Recreation Area	Long	Moderate	High		Recreation	High	C106		✓				0.3 mile	View from boat launch and day use picnic site of the Project through BLM VRM Class III land
52	Dispersed residences southwest of Craig	Long	Moderate	High		Residential	High	C105			✓		✓	1.1 miles	Dispersed residential views
54	South Beach Recreation Area	Long	Moderate	High		Recreation	Moderate	C105			✓			0.1 mile	Recreation views of Yampa River crossing
56	Colorado State Highway 13 (south of Craig)	Moderate	High	Moderate		Travel Route	Moderate	C105			✓			0.5 mile	View from travel route
58	Dispersed residences south of Craig	Long	Low	High		Residential	High	C101			✓			0.5 mile	Dispersed residential views
59	Dispersed residence southeast of Craig	Long	Low	High		Residential	High	C101			✓			0.3 mile	Dispersed residential views
63	Dispersed residence along Colorado State Highway 13	Long	Low	High		Residential	High	C100			✓			0.9 mile	Dispersed residential views
64	Access to Routt National Forest recreation	Moderate	Moderate	Moderate		Travel Route	Moderate	C100			✓			0.4 mile	View from access to Routt National Forrest
66	Dispersed residence along Colorado State Highway 13	Long	Low	High		Residential	High	C13		✓			✓	0.3 mile	Dispersed residential views through BLM VRM Class III land
67	Dispersed residences south of Baggs	Long	Low	High		Residential	High	C27			✓			0.5 mile	Dispersed residential views
83	Moffat County Road 57	Moderate	Moderate	Moderate		Travel Route	Moderate	C106			✓			0.6 mile	View from travel route
150	Dinosaur National Monument (Deerlodge Road)	Long	High	High		Recreation	High	C93			✓	✓		0.5 mile	View from National Monument recreation access
223	U.S. Highway 40 (viewpoint pullout east of Craig)	Long	Low-Moderate	Moderate		Recreation	Moderate	C100			✓			1.6 miles	View from Yampa River/wildlife observation deck
251	U.S. Highway 40 (east of Craig)	Moderate	High	Moderate		Travel Route	Moderate	C100			✓			0.4 mile	View from travel route
252	Colorado State Highway 318 (west of Maybell)	Moderate	High	Moderate		Travel Route	Moderate	C91	✓					0.2 mile	Travel route view of the Project through BLM VRM Class III land
287	Moffat County Road 10	Moderate	Moderate	Moderate		Travel Route	Moderate	C91	✓					0.7miles	View from travel route toward Cross Mountain and the Project through BLM VRM Class III land
288	Colorado State Highway 13 (south of Baggs)	Moderate	High	Moderate		Travel Route	Moderate	C20		✓				1.8 mile	Travel route view of the Project through BLM VRM Class III land
289	Godiva Rim	Moderate	Low-Moderate	Moderate		Travel Route	Moderate	C91	✓					1.2 miles	Proposed scenic road view of the Project through BLM VRM Class III land
290	Sevenmile Ridge Destination Route	Moderate	Low-Moderate	Moderate		Travel Route	Moderate	C91	✓					5.0 miles	View from recreation access of the Project through BLM VRM Class III land
291	Yampa River State Park	Long	Moderate-High	High		Recreation	High	C100			✓			5.2 miles	View from campground within the State Park

TABLE H-1 KEY OBSERVATION POINTS AND SIMULATION LOCATIONS															
KOP ID	Viewing Location Name	Concern Level Factors						Link(s)	Key Observation Point				Simulation ¹	Distance from Project	KOP or Simulation Selection Rationale
		Viewing Duration	Volume of Use	Concern for Aesthetics	Scenic or Historic Status	Type of Use	Overall Concern Level		View from BLM/USFS Administered Land)	View of BLM/USFS Administered Land)	Other	National Significance			
297	Elkhead Reservoir Campground	Long	Moderate-High	High		Recreation	High	C100			✓			2.6 miles	View from campground
299	East Cross Mountain River Access	Moderate-Long	Moderate	Moderate-High		Recreation	Moderate	C91	✓				✓✓	2.5 miles	View from Yampa River access of the Project through BLM VRM Class III land
302	Yampa River (Juniper Canyon)	Long	Moderate	High		Recreation	High	C106	✓					0.3 mile	View from canyon of the Project through BLM VRM Class III land
Bureau of Land Management White River Field Office															
147	Rangely residential	Long	High	High		Residential	High	C185		✓				0.7 mile	Residential views of the Project through BLM VRM Class III land
210	Dinosaur residential	Long	High	High		Residential	High	C187		✓				1.1 miles	Residential views of the Project through BLM VRM Class III land
211	Dinosaur Visitor Center	Long	High	High		Recreation	High	C187		✓		✓	✓✓	1.4 miles	Recreation area view of the Project through BLM VRM Class III land
239	Dinosaur Diamond Scenic Byway (Colorado State Highway 64)	Moderate	High	Moderate-High	Scenic	Travel Route/ Recreation	High	C188	✓			✓		0.4 mile	View from scenic byway of the Project through BLM Class III land
240	Colorado State Highway 64	Moderate	High	Moderate		Travel Route	Moderate	C185	✓					1.0 mile	Travel route view of the Project through BLM VRM Class III land
241	Dinosaur Diamond Scenic Byway in Canyon Pintado National Historic District (Colorado State Highway 139)	Moderate	High	Moderate-High	Scenic	Travel Route/ Recreation	High	C185	✓			✓	✓✓	0.5 mile	View from scenic byway of the Project through BLM Class III land in the Canyon Pintado National Historic District.
242	Whiskey Creek residential	Long	Low	High		Residential	High	C196		✓				0.3 mile	Residential view of the Project adjacent to Whiskey Creek and BLM VRM Class III land
254	U.S. Highway 40 (east of Dinosaur)	Long	High	Moderate		Travel Route	Moderate	C175	✓					0.2 mile	Travel route view of Project in parallel condition through BLM VRM Class III land
310	Crook’s Brand Rock Art Site	Long	Moderate	High	Historic	Recreation	High	C195	✓				✓✓	0.4 mile	Recreation view of the Project through BLM VRM Class IV land
Bureau of Land Management Grand Junction Field Office															
153	Mack residential	Long	Low	High		Residential	High	C270		✓				0.3 mile	Residential view of Project through BLM VRM Class IV land
243	Baxter Pass Road	Moderate-Long	Moderate	High		Travel Route/ Recreation	High	C196	✓					1.4 mile	View from Baxter Pass Overlook of Project through BLM VRM Class IV land
244	Garfield County Road 201 (south of Baxter Pass)	Moderate-Long	Moderate	High		Travel Route/ Recreation	High	C197	✓				✓✓	0.1 mile	Travel route view of Project in parallel condition through BLM VRM Class III land. Access to Demaree Wilderness Study Area
312	Rabbit Valley Dispersed Campsite (McInnis Canyons National Conservation Area)	Long	Moderate	High		Recreation	High	C270	✓					1.4 mile	Recreation view of Project through BLM VRM Class IV land
Utah															
Bureau of Land Management Vernal Field Office															
86	Utah State Route 45 (north of Bonanza)	Moderate	High	Moderate		Travel Route/ Recreation	Moderate	U242	✓					0.6 mile	Travel route view of the Project through BLM VRM Class III and IV land

TABLE H-1 KEY OBSERVATION POINTS AND SIMULATION LOCATIONS															
KOP ID	Viewing Location Name	Concern Level Factors						Link(s)	Key Observation Point				Simulation ¹	Distance from Project	KOP or Simulation Selection Rationale
		Viewing Duration	Volume of Use	Concern for Aesthetics	Scenic or Historic Status	Type of Use	Overall Concern Level		View from BLM/USFS Administered Land)	View of BLM/USFS Administered Land)	Other	National Significance			
87	Enron Recreation Area (on White River)	Long	Moderate	High		Recreation	High	U300	✓				✓✓	0.2 mile	Recreation (boat launch/take out) view of the Project crossing the White River through BLM Class III land
88	Fantasy Canyon	Long	Moderate	High		Recreation	High	U300	✓					1.0 mile	Recreation view of the Project through BLM VRM Class IV land from Fantasy Canyon (unique rock formation)
100	Dispersed residences along Utah State Route 88	Long	Moderate	High		Residential	High	U390		✓				1.3 miles	Dispersed residential view of the Project through BLMVRM Class III land
103	Dinosaur Diamond Scenic Byway (U.S. Highway 40 south of Bridgeland)	Moderate	High	Moderate-High	Scenic	Travel Route/ Recreation	High	U430			✓	✓		0.6 mile	Scenic byway views
105	Dispersed residences south of Duchesne	Long	Moderate	High		Residential	High	U430 U431			✓			2.0 miles	Dispersed residential views from cabin development
107	Ioka residential	Long	Moderate	High		Residential	High	U430			✓			0.3 mile	Residential views
108	Dinosaur Diamond Scenic Byway (U.S. Highway 40 southwest of Roosevelt)	Moderate	High	Moderate-High	Scenic	Travel Route/ Recreation	High	U410			✓	✓		1.4 miles	Scenic byway views
109	Dispersed residences south of Roosevelt	Long	Moderate	High		Residential	High	U410			✓		✓	0.2 mile	Dispersed residential views
110	Roosevelt residential	Long	Moderate	High		Residential	High	U410			✓			1.4 miles	Residential views
111	Bottle Hollow Reservoir	Long	Moderate	Moderate		Recreation	Moderate	U410			✓			0.9 mile	Recreation views
113	Utah State Route 88 (north of Leota)	Moderate	Moderate-High	Moderate		Travel Route/ Recreation	Moderate	U390	✓					1.4 miles	Travel route view of the Project through BLM VRM Class III land
200	Argyle Canyon Road	Moderate	Low-Moderate	Moderate		Travel Route	Moderate	U404	✓				✓	0.1 mile	Travel route view of Project crossing BLM VRM Class III land
203	Fourmile Bottom	Moderate	Low-Moderate	High	Scenic	Recreation	High	U400	✓				✓✓	1.0 mile	Recreation views from Fourmile Bottom and Green River (Wild and Scenic River eligible) of the Project crossing through BLM VRM Class II land
268	U.S. Highway 40 Pullout (west of Fruitland)	Moderate	High	Moderate		Travel Route/ Recreation	Moderate	U426			✓			0.4 mile	Travel route pullout views
269	Fruitland residential	Long	Moderate	High		Residential	High	U426			✓		✓	0.3 mile	Residential views
270	Starvation Reservoir	Long	High	High		Recreation	High	U420			✓			2.4 miles	Recreation views
271	Bridgeland residential	Long	Moderate	High		Residential	High	U430			✓			0.2 mile	Residential views
272	Sand Wash North Destination Route	Moderate	Moderate	High		Travel Route/ Recreation	High	U400	✓				✓✓	0.6 mile	Travel route view of the Project through BLM Class IV land. Destination route to Sand Wash Rafting Launch for Desolation/Grey Canyon on Green River.
273	Nine Mile Canyon Scenic Backway	Moderate-Long	Moderate-High	High	Scenic	Travel Route/ Recreation	High	U401	✓			✓		0.4 mile	Scenic backway view of the Project through BLM VRM Class III land
325	Argyle Canyon residences	Long	Moderate	High		Residential	High	U432			✓		✓	0.2 mile	Residential views

TABLE H-1 KEY OBSERVATION POINTS AND SIMULATION LOCATIONS															
KOP ID	Viewing Location Name	Concern Level Factors						Link(s)	Key Observation Point				Simulation ¹	Distance from Project	KOP or Simulation Selection Rationale
		Viewing Duration	Volume of Use	Concern for Aesthetics	Scenic or Historic Status	Type of Use	Overall Concern Level		View from BLM/USFS Administered Land)	View of BLM/USFS Administered Land)	Other	National Significance			
328	Indian Canyon Scenic Byway	Moderate-Long	High	High	Scenic	Travel Route/Recreation	High	U520			✓✓		✓✓	0.4 mile	Scenic byway view of the Project in parallel condition
330	Dispersed residences north of Emma Park	Long	Moderate	High		Residential	High	U512			✓			0.3 mile	Residential views
Bureau of Land Management Moab Field Office															
145	Thompson Springs residential	Long	High	High		Residential	High	U486			✓			0.3 mile	Residential views
152	Interstate 70 Harley Dome Rest Area (Dinosaur Diamond Scenic Byway)	Long	High	Moderate-High	Scenic	Recreation	High	U490		✓		✓	✓✓	1.0 mile	Scenic byway overlook views of the Project through BLM VRM Class III land
193	Interstate 70 Crescent Junction Rest Stop (Dinosaur Diamond Scenic Byway)	Long	High	Moderate-High	Scenic	Recreation	High	U486		✓		✓	✓✓	1.0 mile	Scenic byway overlook views of the Project through BLM VRM Class III land
245	Old U.S. Highway 6 (west of Mack)	Moderate	Moderate	Moderate		Travel Route	Moderate	U490	✓					0.4 mile	Travel route view of the Project in a parallel condition through BLM VRM Class III land
246	Dinosaur Diamond Scenic Byway (I-70 east of Thompson Springs)	Moderate	High	Moderate-High	Scenic	Travel Route / Recreation	High	U490	✓			✓		0.5 mile	Scenic route view of the Project in parallel condition through BLM VRM Class III land
279	Old Spanish National Historic Trail (Near Thompson Springs Utah)	Long	Low	High	Historic	Recreation	High	U486	✓			✓	✓✓	0.7 mile	National Historic Trail view of the Project through BLM VRM Class III land
282	Interstate 70 Thompson Welcome Center (Dinosaur Diamond Scenic Byway)	Long	High	Moderate-High	Scenic	Recreation	High	U490	✓			✓	✓✓	1.2 miles	Recreation view of the Project through BLM Class III land
301	Arches National Park boundary (Salt Valley)	Long	Moderate	High		Recreation	High	U490		✓		✓		13.4 miles	Distant view of the Project through BLM Class III land from the boundary of Arches National Park
306	Upper Colorado River Scenic Byway	Moderate	High	High	Scenic	Travel Route / Recreation	High	U486		✓		✓	✓✓	0.6 mile	Scenic route view of the Project through BLM VRM Class II land
313	Dinosaur Diamond Scenic Byway (Interstate 70 crossing)	Moderate	High	Moderate-High	Scenic	Travel Route / Recreation	High	U487	✓					1.7 mile	Scenic route view of the Project through BLM Class III land
319	Green River	Long	Moderate	High		Recreation	High	U487		✓			✓✓	0.7 mile	River recreation view of the Project through BLM VRM Class II land
Bureau of Land Management Price Field Office															
26	Huntington State Park	Long	Moderate-High	High		Recreation	High	U498 U587			✓			3.8 miles	State Park recreation views
27	Huntington residential	Long	High	High		Residential	High	U628			✓			1.9 miles	Residential views
32	Cedar Mountain Overlook (San Rafael Swell)	Long	Moderate	High		Recreation	High	U729	✓				✓✓	1.1 miles	Recreation view of the Project through BLM VRM Class III land
40	Dispersed residences northeast of Wellington	Long	Low	High		Residential	High	U492		✓				0.5 mile	Dispersed residential view of the Project through BLM Class IV land
41	Dinosaur Diamond Scenic Byway (U.S. Highway 6)	Moderate	High	Moderate-High	Scenic	Travel Route/Recreation	High	U489	✓			✓	✓	0.2 mile	Scenic byway view of the Project through BLM VRM Class III land
201	Crystal Geyser	Long	Low-Moderate	High		Recreation	High	U487		✓				0.3 mile	Recreation views of the Project through BLM VRM Class III land from a unique geologic formation. View of Project crossing Green River

TABLE H-1 KEY OBSERVATION POINTS AND SIMULATION LOCATIONS															
KOP ID	Viewing Location Name	Concern Level Factors						Link(s)	Key Observation Point				Simulation ¹	Distance from Project	KOP or Simulation Selection Rationale
		Viewing Duration	Volume of Use	Concern for Aesthetics	Scenic or Historic Status	Type of Use	Overall Concern Level		View from BLM/USFS Administered Land)	View of BLM/USFS Administered Land)	Other	National Significance			
207	Dispersed residences northeast of Castle Dale	Long	Low	High		Residential	High	U765			✓			0.7 mile	Dispersed residential views
208	West Helper residences	Long	High	High		Residential	High	U546		✓			✓✓	0.2 mile	Residential view of the Project through BLM VRM Class III land
213	Clear Creek residences	Long	Moderate	High		Residential	High	U600			✓			0.4 mile	Residential views
218	Wedge Overlook Scenic Backway	Moderate-Long	Moderate	High	Scenic	Travel Route/ Recreation	High	U731	✓			✓		0.6 mile	Scenic backway views of the Project through BLM VRM Class III land
255	Mexican Mountain Wilderness Study Area	Long	Low	High		Recreation	High	U730	✓					0.5 mile	Views from Wilderness Study Area of the Project through BLM VRM Class III land
256	Dinosaur Diamond Scenic Byway (U.S. Highway 6 east of Wellington)	Moderate	High	Moderate-High	Scenic	Travel Route/ Recreation	High	U494		✓		✓	✓	0.4 mile	Scenic travel route views of the Project through BLM VRM Class III land
257	Dispersed residences east of Wellington	Long	High	High		Residential	High	U494		✓				1.5 miles	Dispersed residential view of the Project on BLM Class III land
258	Martin residential	Long	High	High		Residential	High	U545 U546		✓				0.3 mile	Residential views of the Project through BLM VRM Class III land
259	Energy Loop Scenic Byway (Utah State Route 96)	Moderate	High	High	Scenic	Travel Route/ Recreation	High	U600			✓	✓		0.5 mile	Scenic byway views
274	Indian Canyon Scenic Byway (U.S. Highway191)	Moderate-Long	High	High	Scenic	Travel Route/ Recreation	High	U435			✓	✓	✓✓	0.3 mile	Scenic byway view of the Project in parallel condition
305	Wedge Overlook Scenic Backway	Moderate-Long	Moderate	High	Scenic	Travel Route/ Recreation	High	U732	✓			✓	✓✓	2.2 miles	Scenic backway views of the Project through BLM VRM Class III land
314	Little Grand Canyon Overlook	Long	Moderate	High		Recreation	High	U733	✓					5.1 miles	Distant recreation view of the Project through BLM VRM Class III land.
320	Junction of Road to Buckhorn Wash (Buckhorn Draw Road Scenic Backway)	Moderate-Long	Moderate	High	Scenic	Travel Route	High	U732	✓				✓✓	0.7 mile	Scenic backway view of the Project through BLM VRM Class III land
322	U.S. Highway 6 Rest Area (Dinosaur Diamond Scenic Byway)	Moderate	High	Moderate-High	Scenic	Travel Route/ Recreation	High	U489	✓			✓	✓✓	1.0 mile	Rest area view of the Project through BLM VRM Class IV land
323	Old Railroad Grade (adjacent to Mexican Mountain Wilderness Study Area)	Moderate-Long	Low-Moderate	High		Travel route	High	U730	✓				✓	0.2 mile	Travel route view along historic railroad grade of the Project through BLM VRM Class III land
324	Dinosaur Diamond Scenic Byway (U.S. Highway 6 north of Woodside)	Moderate	High	Moderate-High	Scenic	Travel Route/ Recreation	High	U489	✓			✓	✓✓	0.6 mile	Travel route view of the Project through BLM VRM Class III land
326	San Rafael Swell Destination Route (Green River Cutoff Road)	Moderate	Moderate	High		Travel Route	High	U734	✓					0.1 mile	Travel route view of the Project through BLM VRM Class III lands
Bureau of Land Management Salt Lake Field Office															
22	Soldier Summit	High	Low	High		Residential	High	U530			✓			0.5 mile	Residential views
266	U.S. Highway 6 (Spanish Fork Canyon)	Moderate	High	Moderate		Travel Route	Moderate	U460			✓		✓✓	1.2 mile	Travel route views
Bureau of Land Management Richfield Field Office															
205	Fountain Green residential	Long	High	High		Residential	High	U631		✓				1.5 miles	Residential view of the Project through BLM VRM Class III land
206	Dispersed residences north of Mount Pleasant	Long	Low	High		Residential	High	U630			✓			0.4 mile	Dispersed residential views

TABLE H-1 KEY OBSERVATION POINTS AND SIMULATION LOCATIONS															
KOP ID	Viewing Location Name	Concern Level Factors						Link(s)	Key Observation Point				Simulation ¹	Distance from Project	KOP or Simulation Selection Rationale
		Viewing Duration	Volume of Use	Concern for Aesthetics	Scenic or Historic Status	Type of Use	Overall Concern Level		View from BLM/USFS Administered Land)	View of BLM/USFS Administered Land)	Other	National Significance			
212	Fairview residential	Long	Moderate	High		Residential	High	U600 U636			✓			1.1 mile	Residential views
261	Fairview residential	Long	High	High		Residential	High	U600 U636			✓		✓✓	1.7 miles	Residential views
262	Mount Pleasant dispersed residences	Long	Low	High		Residential	High	U630			✓		✓✓	0.3 mile	Dispersed residential views
263	Mount Pleasant residential	Long	High	High		Residential	High	U630			✓			1.1 mile	Residential views
264	Big Hollow Wildlife Management Area Destination Route (Fountain Green)	Moderate-Long	Moderate	Moderate		Travel Route	Moderate	U631		✓				0.6 mile	Travel route view of the Project through BLM VRM Class III land
Bureau of Land Management Fillmore Field Office															
131	Mount Nebo Loop Scenic Byway	Moderate-Long	High	High	Scenic	Travel Route/ Recreation	High	U639			✓	✓		0.5 mile	Scenic byway views
204	Nephi residential	Long	High	High		Residential	High	U650			✓			0.2 mile	Residential views
214	Utah State Route 132 (north of Fountain Green)	Moderate	High	Moderate		Travel Route	Moderate	U639		✓				0.5 mile	Travel route view of the Project through BLM VRM Class IV land
215	Mona residential	Long	High	High		Residential	High	U640		✓				2.0 miles	Residential view of the Project through BLM VRM Class III land
265	Interstate 15 (Nephi)	Short	High	Low-Moderate		Travel Route	Moderate	U650			✓		✓✓	0.2 mile	Travel route views
Ashley National Forest															
315	Sowers Canyon Road	Long	Low-Moderate	Moderate-High		Travel Route	Moderate	U431	✓					0.1 mile	Travel route view of the Project in a parallel condition through USFS Modification VQO
327	Avintaquin Campground	Long	Moderate	High		Recreation	High	U513	✓					0.4 mile	Recreation view of the Project through USFS Retention VQO
329	Reservation Ridge Scenic Backway	Moderate-Long	Moderate	High	Scenic	Travel Route/ Recreation	High	U515	✓					0.4 mile	Travel route view of the Project in a parallel condition through USFS Partial Retention VQO
Manti-La Sal National Forest															
28	Fairview Lakes Overlook (Energy Loop Scenic Byway)	Long	High	High	Scenic	Recreation	High	U600	✓			✓		2.8 miles	Recreation view of the Project through USFS Partial Retention VQO
30	Electric Lake	Long	Moderate	Moderate		Recreation	Moderate	U600	✓					1.7 miles	Recreation view of the Project through USFS Partial Retention VQO
36	Birdseye residential	Long	Moderate	High		Residential	High	U621		✓				1.1 miles	Residential view of the Project through USFS Partial Retention VQO
194	Potters Ponds	Long	Moderate	High		Recreation	High	U630	✓					0.6 mile	Recreation view of the Project through USFS Partial Retention and Modification VQO
195	Indian Creek Campground	Long	Moderate	High		Recreation	High	U630	✓				✓✓	0.3 mile	Recreation view of the Project through USFS Modification and Partial Retention VQO
196	Fairview Lakes residential	Long	High	High		Residential	High	U600		✓				1.4 miles	Residential view of the Project through USFS Partial Retention VQO
217	Skyline Drive Scenic Backway	Moderate-Long	High	High	Scenic	Travel Route/ Recreation	High	U630	✓			✓	✓	0.3 mile	Scenic route view of the Project through USFS Partial Retention VQO

TABLE H-1 KEY OBSERVATION POINTS AND SIMULATION LOCATIONS															
KOP ID	Viewing Location Name	Concern Level Factors						Link(s)	Key Observation Point				Simulation ¹	Distance from Project	KOP or Simulation Selection Rationale
		Viewing Duration	Volume of Use	Concern for Aesthetics	Scenic or Historic Status	Type of Use	Overall Concern Level		View from BLM/USFS Administered Land)	View of BLM/USFS Administered Land)	Other	National Significance			
260	Energy Loop Scenic Byway (Utah State Route 31)	Moderate	High	High	Scenic	Travel Route/ Recreation	High	U600	✓			✓	✓✓	0.3 mile	Scenic byway view of the Project through USFS Partial Retention VQO
283	Energy Loop Scenic Byway (Utah State Route 31)	Moderate	High	High	Scenic	Travel Route/ Recreation	High	U600			✓	✓		0.5 mile	Scenic byway views
284	Energy Loop Scenic Byway (Utah State Route 264)	Moderate	High	High	Scenic	Travel Route/ Recreation	High	U600		✓		✓	✓✓	0.5 mile	Scenic byway view of the Project through USFS Partial Retention VQO
307	Energy Loop Scenic Byway (Utah State Route 264)	Moderate	High	High	Scenic	Travel Route/ Recreation	High	U600	✓			✓		0.6 mile	Scenic byway view of the Project through USFS Partial Retention VQO.
308	Millers Flat Road	Moderate-Long	Moderate	High		Travel Route/ Recreation	High	U630	✓					0.8 mile	Recreation destination route view of the Project through USFS Modification VQO.
309	Bear Creek Campground	Long	Moderate	High		Recreation	High	U629		✓			✓	2.2 miles	Recreation view of the Project through USFS Partial Retention VQO.
Uinta-Wasatch-Cache National Forest															
216	U.S. Highway 6 (west of Soldier Summit)	Moderate	High	Moderate		Travel Route	Moderate	U539	✓					0.4 mile	Travel route view of the Project through USFS Partial Retention VQO
267	Battle Flats Recreation Area (Strawberry Reservoir)	Long	High	High		Recreation	High	U424	✓					1.9 miles	Recreation views
285	Aspen Grove Campground	Long	Moderate-High	High		Recreation	High	U424	✓				✓✓	0.4 mile	Recreation views
304	Sheep Creek Road (Forest Road 042)	Moderate	Moderate	Moderate-High		Travel Route/ Recreation	Moderate	U433	✓				✓✓	0.4 mile	Recreation destination route view of the Project through USFS Partial Retention VQO
NOTES: ¹ ✓ = direct effect simulation only; ✓✓ = direct and cumulative effect simulation BLM = Bureau of Land Management KOP ID = Key Observation Point Identification USFS = U.S. Forest Service VQO = Visual Quality Objective (USFS) VRM = Visual Resource Management (BLM)															

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/3/2011
BLM Field Office/National Forest:	Salt Lake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 10S	Location Sketch 
Key Observation Point # 22 Soldier Summit	Range: 7E	
VRM Class/VQO: n/a	Section: 24	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rolling, domed, smooth	Diverse, numerous amorphous patches	Vertical, geometric
Line	Smooth, angular, simple	Butt and diffuse edges	Vertical, diagonal, weak concave/horizontal
Color	Tans	Dark greens, sage greens, tans, seasonal variety	Grays, browns
Texture	Medium grain	Medium to coarse grain	Ordered, medium grain, dense

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin; geometric, triangular
Line	Geometric, curvilinear	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/3/2011
BLM Field Office/National Forest:	Salt Lake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from residences in Solider Summit, Utah

Moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting associated with residences in Solider Summit, Utah. The proposed Project would be seen from a level position in a backdropped condition through rolling terrain. Disturbance associated with construction access and tower pads would weakly contrast with existing landform and vegetation characteristics since the proposed Project would be viewed in context with other landscape modifications. The proposed structures and conductors would be seen 0.5 mile away and would have moderate contrast with structural elements of form, line, color, and texture as the proposed Project would be seen with other structures and modifications in this landscape.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 17S	Location Sketch 
Key Observation Point # 26 Huntington State Park	Range: 9E	
VRM Class/VQO: n/a	Section: 17	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Prominent, bold, rugged; level, horizontal	Amorphous patches, stippled areas, band of vegetation along reservoir	Vertical, geometric
Line	Angular, complex, jagged; horizontal, smooth	Butt, digitate, and diffuse edges, vertical, indistinct in valley	Vertical, angular
Color	Grays, tans, browns, reds, blues, reflective	Dark greens, sage greens, tans	Gray, transparent, reflective, white
Texture	Fine to coarse grain	Fine to medium grain	Fine to medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, thin, triangular
Line	n/a	n/a	Vertical/diagonal; thin/weak concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from dock at Huntington State Park

Weak contrast would result from the construction and operation of the proposed Project in a panoramic landscape viewed from the dock at the Huntington State Park. The proposed Project would cross relatively flat to slightly rolling terrain and would be backdropped by the Wasatch Plateau. Disturbance associated with construction access and vegetation clearing would not be visible from the KOP due to topographic screening. The proposed structures would be located approximately 4 miles away, beyond two existing 345kV transmission lines, and would be mostly screened by topography. Therefore, structure contrast was assessed to be weak from this viewpoint.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 17S	Location Sketch 
Key Observation Point # 27 Huntington residential	Range: 8E	
VRM Class/VQO: n/a	Section: 24	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Prominent, bold, rugged (Wasatch Plateau); level, horizontal (valley)	Amorphous patches, stippled areas	Vertical, geometric, rectangular (homes)
Line	Angular, complex, jagged (Wasatch Plateau); horizontal, smooth (valley)	Butt and diffuse edges, indistinct in valley	Vertical, angular
Color	Grays, tans, browns, reds	Dark greens, tans	Gray, transparent, reflective, white
Texture	Fine (valley) to coarse (Wasatch Plateau) grain	Fine to medium grain	Fine to medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin; geometric, triangular
Line	Geometric, curvilinear	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Browns, tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View west from residences in Huntington, Utah

Weak contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting viewed from residences in Huntington, Utah. The proposed Project would cross relatively flat to slightly rolling terrain and would be backdropped by adjacent terrain. Disturbances associated with the construction of access roads and right-of-way vegetation clearing would be mostly screened from this KOP. Where visible, these project components would weakly contrast with the existing landscape character. The proposed structures would be seen approximately 2 miles away beyond three existing 345kV transmission lines. Due to the presence of multiple existing transmission lines, structure contrast was assessed to be at a weak level.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 9/27/2011
BLM Field Office/National Forest: Manti-La Sal National Forest
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 14S	Location Sketch 
Key Observation Point # 28 Fairview Lakes Overlook-The Energy Loop Scenic Byway	Range: 5E	
VRM Class/VQO: Partial Retention	Section: 2	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Wide trough-shaped, rolling, rounded	Amorphous patches, distinct, vertical, complex, pyramidal	Low, geometric
Line	Continuous, curving, horizontal, diagonal	Flowing, complex, irregular, butt edges	Angular, vertical
Color	Tans, grays, blue	Vivid, greens, tans, seasonal variety	Greens, browns, whites
Texture	Fine to medium grain	Medium to coarse grain	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Thin, vertical
Line	Geometric, curvilinear	Angular, butt edge	Thin vertical
Color	Tans	Tans, gray-green	Dull gray
Texture	Fine grain	Fine to medium grain	Uniform repeating medium grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from Fairview Lakes Overlook, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting designated by the Manti-La Sal National Forest as a partial retention VQO as viewed from the Fairview Lakes Overlook. The proposed Project would traverse moderately steep terrain and would be backdropped by adjacent terrain. Disturbance associated with construction access and right-of-way vegetation clearing would produce weak/moderate landscape contrast through the development of geometric forms and curvilinear lines incongruent with the existing landscape character. The proposed structures would be seen approximately 3 miles away from this KOP and due to the distance of these views, the structures would introduce a weak contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 30 Electric Lake	Range: 6E	
VRM Class/VQO: Partial Retention	Section: 34	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Diagonal, bold, rounded	Vertical, complex, pyramidal, amorphous	n/a
Line	Curving, continuous, horizontal	Flowing, complex, irregular, background butt edge (right-of-way)	n/a
Color	Tans, blues, reflective	Vivid, tans, greens, gray-green, white	n/a
Texture	Smooth surface on reservoir, medium grain	Coarse, stippled, scattered	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric	Vertical, rhythmic; geometric/triangular
Line	Curvilinear, horizontal	Horizontal, butt edge	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View north from Electric Lake recreation area, Utah

Weak/moderate to moderate contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting designated as a partial retention VQO by the Manti-La Sal National Forest as seen from Electric Lake. The proposed Project would cross moderately steep terrain with views partially screened by topography. Disturbance associated with construction access would generally be screened by vegetation except near the top of the slope where the cleared right-of-way would be visible as well as construction access. The proposed structures would be seen approximately 1.5 miles away and would be skylined since the proposed Project is located on the top of the ridgeline before descending into a side canyon.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 19S Range: 12E Section: 18	Location Sketch 
Key Observation Point # 32 Cedar Mountain Overlook		
VRM Class/VQO: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Simple, rolling, flat to bold, definite, V-shaped canyons	Amorphous patches and stippled areas	Vertical, geometric
Line	Simple to complex, bold, horizontal, diagonal, vertical	Weak, diffuse and butt edges	Thin, vertical
Color	Light tans, browns, reds	Juniper greens, tans	Brown
Texture	Fine to rough grain	Medium grain	Fine grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin; geometric, triangular
Line	Curvilinear, geometric	Indistinct, regular	Vertical/diagonal; thin concave (conductors)
Color	Light tans, browns, reds	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from Cedar Mountain Overlook, UT

Moderate contrast would result from the construction and operation of the proposed Project, within a panoramic landscape designated as VRM Class III viewed from the Cedar Mountain Overlook. The proposed Project crosses flat to gently rolling terrain and would be backdropped due to the superior view from the overlook. Disturbance associated with construction access would introduce curvilinear lines and geometric forms similar to the disturbances associated with the existing transmission line. Vegetation clearing would be mostly limited to tower pads and access roads which due to the superior viewing position, would produce distinct geometric forms. The proposed structures would be seen at approximately 1 mile and are adjacent to an existing 345kV transmission line.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/26/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 10S	Location Sketch 
Key Observation Point # 36 Birdseye residential	Range: 3E	
VRM Class/VQO: Partial Retention	Section: 26	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Bold, prominent, rugged	Dense to scattered vegetation, amorphous clearings	Vertical, geometric
Line	Diagonal, undulating, bold	Diffuse edges	Vertical/diagonal; thin/weak concave (conductors)
Color	Reds, tans	Light and dark greens	Dull gray, transparent
Texture	Medium to coarse grain	Fine to medium grain	Uniform medium grain, medium to sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, thin, triangular
Line	Curvilinear, geometric	Horizontal, butt edge	Vertical/diagonal; thin/weak concave (conductors)
Color	Reds, tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/26/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View east from Birdseye Road adjacent to residences, Utah

Moderate contrast would result from the construction and operation of the proposed Project within an enclosed landscape designated by the Manti-La Sal NF as a partial retention VQO as viewed from residences in Birdseye. The proposed Project would cross steep terrain and include right-of-way clearing producing geometric forms which would be more dominant than the vegetation clearing associated with the existing transmission line. Disturbance associated with construction access would also produce geometric forms as well as curvilinear lines that are incongruent with the existing landscape. The proposed structures would be seen 1.2 miles away and would produce a weak/moderate structure contrast due to the adjacent existing 345kV transmission line. Selective mitigation measure #3 (minimize cut and fill) and #4 (minimize tree clearing) would be applied to reduce contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/12/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 14S	Location Sketch 
Key Observation Point # 40 Dispersed residences northeast of Wellington	Range: 11E	
VRM Class/VQO: IV	Section: 34	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Geometric plateaus, level	Indistinct, patches, stippled	Geometric, low
Line	Horizontal, broken diagonal	Indistinct	Vertical, diagonal
Color	Tans	Gray-greens, tans	White, gray
Texture	Fine to medium grain	Medium grain	Medium grain

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Tans, reds, light brown	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/12/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southeast from residences northeast of Wellington, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting with a VRM Class IV designation associated with views from residences northeast of Wellington. The proposed Project would cross flat to gently rolling terrain and be viewed in a partially backdropped condition from a level viewing position. Earthwork associated with the construction of access roads as well as right-of-way clearing would be mostly screened but where visible, would produce geometric forms and curvilinear lines. The proposed structures would be seen at approximately 0.5 mile from these residences. Since there are no adjacent major existing structural elements in the landscape, the proposed structures would introduce strong structure contrast and would dominate views from these residences.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 19S	Location Sketch 
Key Observation Point # 41 Dinosaur Diamond Scenic Byway (U.S. Highway 6)	Range: 14E	
VRM Class/VQO: III	Section: 3	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	FG: Flat, smooth BG: Bold vertical, horizontal, rugged	FG: Short, patchy BG: Few, stippled	Vertical, geometric
Line	FG: Horizontal BG: Horizontal banding, diagonal,	FG: Angular, broken, diffuse edges BG: Weak diffuse, indistinct	Vertical, horizontal; concave (conductors)
Color	FG: Tans, beiges BG: Tans, grays, reds	FG: Gray-greens, dull BG: Juniper greens	Brown
Texture	FG: Fine grain BG: Banded, course grain	FG: Even, medium grain BG: Fine to medium grain	Medium grain, dense, ordered, repeating

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical, rhythmic and diminishing; complex
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, beiges	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southeast from Dinosaur Diamond Scenic Byway (U.S. Highway 6), Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project, within a panoramic landscape designated by the BLM as VRM Class III and viewed from U.S. Highway 6. The proposed Project crosses flat to gently rolling terrain and would be mostly skylined due to proximity to the viewer. Construction access would introduce curvilinear lines and geometric forms into the landscape. Vegetation clearing in the right-of-way would be minimal and if seen, would introduce weak geometric forms slightly contrasting with existing vegetation patterns. The proposed structures would be seen directly adjacent to the road in context with a smaller, 138kV transmission line and due to the long duration view, would introduce a moderate/strong structure contrast. To further mitigate contrast on views from this scenic highway, the proposed Project would need to be located further to the east which would place it outside of the designated utility corridor.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/28/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6N Range: 95W Section: 2	Location Sketch 
Key Observation Point # 50 Maybell residential		
VRM Class/VQO: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Moderately rolling to slightly concave, blocky, pyramidal	Amorphous patches, stippled	Vertical, geometric, triangular
Line	Horizontal, diagonal	Irregular butt and diffuse edges	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Tans, browns, grays, reds	Greens yellow, tan	Dull gray, transparent, browns
Texture	Fine to medium grain	Fine to medium grain	Repeating medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Geometric tower pads and access through moderately steep side slope	Geometric clearings with reestablished low vegetation, most	Vertical, geometric, triangular
Line	Horizontal, diagonal	Horizontal and diagonal butt edges created at clearing through pinyon-	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Browns	Greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating medium grain, medium density

Degree of Contrast

		Features											
		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/28/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



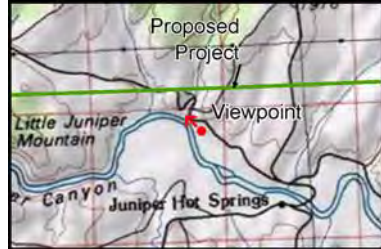
View south from U.S. Highway 40, Colorado

Weak contrast would result from the construction and operation of the proposed Project in a panoramic landscape associated with dispersed residences along U.S. Highway 40 near Maybell, Colorado. The proposed Project would traverse dissected, sloping terrain in both a backdropped and skylined condition. Construction access and tower pad disturbance would weakly contrast with existing landform characteristics since access for the existing transmission lines and surface mining operations both occur within this view. Weak/moderate contrast with existing vegetation patterns would occur where right-of-way clearing through pinyon-juniper vegetation would create geometric forms. Weak structure contrast would be generated since the proposed Project would be viewed beyond an existing 345kV and 138kV transmission line. To further reduce contrast on views from these residences, selective mitigation measure #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would be applied.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/28/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6N	Location Sketch 
Key Observation Point # 51 Juniper Canyon Recreation Area	Range: 94W	
VRM Class/VQO: III	Section: 17	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, meandering to blocky/pyramidal	Mottled/stippled to amorphous patch, strip, clumped groupings	Geometric, vertical
Line	Horizontal, diagonal	Indistinguishable, diffuse and butt edges	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, browns	Greens, yellows, reds, sage	Grays, browns
Texture	Fine to medium grain	Fine to medium grain	Repeating medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Minimal disturbance from geometric clearings for tower pads	Geometric areas of reestablished low growing vegetation	Vertical, rhythmic; geometric/triangular
Line	Diagonal, horizontal	Horizontal, diagonal butt edge created at clearings for tower pads	Vertical/diagonal, horizontal; concave (conductors)
Color	Tan	Greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/28/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from Juniper Canyon Recreation Area, Colorado

Moderate contrast would result from the construction and operation of the proposed Project within a feature landscape setting with VRM Class III designation and associated with the Juniper Canyon Recreation Area. The proposed Project would be viewed from an inferior position as it traverses through rolling terrain in a skylined condition. Disturbance associated with construction access and tower pads would have moderate contrast with existing landform and vegetation features as the new access and right-of-way clearing would be visible in rolling terrain. Moderate structure contrast would occur where recreationists would have unobstructed views of the structures and conductors skylined above the horizon. Two existing transmission lines are viewed in a partially screened condition beyond the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	2/7/2012
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6N	Location Sketch 
Key Observation Point # 52 Dispersed residences southwest of Craig	Range: 92W	
VRM Class/VQO: n/a	Section: 13	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Gently sloping, rolling	Low, amorphous and geometric patches, tall clumping	Vertical, thin, triangular
Line	Undulating horizontal, diagonal	Straight diagonal and horizontal butt edges	Vertical/diagonal; thin/weak concave (conductors)
Color	Browns, tans	Variations of greens, tans, yellow	Dull gray, transparent
Texture	Fine grain	Fine to coarse grain	Uniform coarse grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal	Low, flat	Vertical, thin, triangular
Line	Curvilinear, horizontal	Regular, butt edge	Vertical/diagonal; thin/weak concave (conductors)
Color	n/a	Greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	2/7/2012
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from Moffat County Road 30 (Round Bottom Road), Colorado

Weak contrast would result from the construction and operation of the proposed Project in a panoramic landscape associated with dispersed residences along Moffat County Road 30, west of Craig, Colorado. The proposed Project would cross rolling terrain in a backdropped condition. Earthwork associated with the construction of access roads and right-of-way clearing would be mostly screened but where visible, would produce geometric forms and curvilinear lines in the landform and vegetation. The proposed structures and conductors would be seen at approximately 1 mile with existing structures of similar scale and size visible in front of the proposed Project. The proposed Project would introduce weak structure contrast due to the dominance of the existing transmission lines.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 2/7/2012
BLM Field Office/National Forest: Little Snake Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6N	Location Sketch 
Key Observation Point # 54 South Beach Recreation Area	Range: 91W	
VRM Class/VQO: n/a	Section: 16	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, meandering to blocky	Mottled/stippled, strip, clumped groupings	Bold, vertical; complex geometric/triangular
Line	Horizontal, diagonal	Indistinguishable to butt edge (at river)	Vertical/diagonal; thin concave (conductors)
Color	Tans, browns, reds	Greens, yellows, reds, sage	Dull gray, transparent
Texture	Fine to medium grain	Fine to coarse grain	Coarse grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Bold, vertical; complex geometric/triangular
Line	n/a	n/a	Vertical/diagonal; thin concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	2/7/2012
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



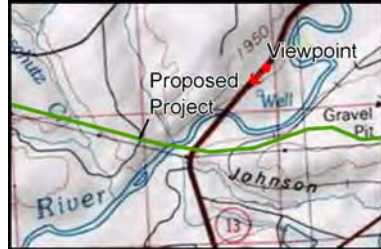
View west from South Beach Recreation Area, Yampa River, Colorado

Weak/moderate contrast would result from the construction and operation of the proposed Project in an enclosed landscape setting associated with the South Beach Recreation Area along the Yampa River. The proposed Project would be seen from an inferior viewing position as it crosses over elevated terrain in a skylined condition. Disturbance associated with construction access and tower pads would not be visible from this KOP. The proposed structures and conductors would be seen directly adjacent to the recreation area and would have weak/moderate contrast due to the presence of two existing 345kV transmission lines.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/27/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6N	Location Sketch 
Key Observation Point # 56 Colorado State Highway 13 (south of Craig)	Range: 91W	
VRM Class/VQO: n/a	Section: 9	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Gently sloping, rolling, geometric/blocky	Low, amorphous geometric patches, concentrated thick band	Vertical, rhythmic and diminishing; geometric/triangular
Line	Strong diagonal, straight and undulating horizontal	Butt edges	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns, tans, grays	Variations of greens, tans, yellows, reds	Grays, browns, white
Texture	Fine to medium grain	Fine to coarse grain	Repeating coarse to medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Minimal disturbance for geometric tower pads and access roads	Thin horizontal patch of reestablished vegetation at tower	Vertical, rhythmic and diminishing; geometric/triangular
Line	Thin, horizontal	Horizontal butt edge created at clearings	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from Colorado State Highway 13

Weak contrast would result from the construction and operation of the proposed Project in a modified, panoramic landscape setting. The proposed Project would cross through rolling terrain as viewed from Colorado State Highway 13, near Craig, from a level view. Disturbance to landform and vegetation associated with construction access would introduce weak contrast with existing features. Weak structure contrast would occur from the introduction of the structures and conductors in this landscape since the proposed Project parallels similar structures. To reduce contrast, selective mitigation measure #8 (match tower spans) would be applied to decrease the visual space occupied by the transmission structures when viewed in context with the existing transmission lines.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/27/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6N	Location Sketch 
Key Observation Point # 58 Dispersed residences south of Craig	Range: 90W	
VRM Class/VQO: n/a	Section: 18	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Gently sloping, rolling	Low, amorphous geometric patches	Vertical, rhythmic and diminishing; geometric/triangular
Line	Gently curving horizontal	Strong geometric lines created by grazing development	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Browns	Variations of greens, tans, sage, reds	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic and diminishing; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Browns	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from Moffat County Road 35

Weak contrast would result from the construction and operation of the proposed Project in a panoramic landscape associated with dispersed residences along Moffat County Road 35. The proposed Project would cross rolling terrain in backdropped and skylined conditions. Earthwork associated with the construction of access roads and right-of-way clearing would be mostly screened but where visible, would produce geometric forms and curvilinear lines in the landform and vegetation components of contrast. The proposed structures and conductors would be seen at approximately 1 mile in context with existing transmission lines of similar scale and size, and therefore, would introduce weak structure contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6N	Location Sketch 
Key Observation Point # 59 Dispersed residences southeast of Craig	Range: 90W	
VRM Class/VQO: n/a	Section: 13	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Gently sloping, rolling	Low, amorphous and geometric patches	Thin vertical, rectangular
Line	Gently curving horizontal	Butt diagonal and horizontal edges	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns	Variations of greens, tans, yellows	Brown
Texture	Fine grain	Fine to medium grain	Fine grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Minimal disturbance for geometric clearings for tower pads and access	Geometric patches of low reestablished vegetation	Bold, vertical, rhythmic; complex geometric/triangular
Line	Diagonal, horizontal	Diagonal and horizontal butt edges at clearings	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southeast from Colorado State Route 394

Moderate/strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting associated with a dispersed residence along Colorado State Route 394, southeast of Craig, Colorado. The proposed Project would traverse rolling terrain and would be viewed in a skylined condition from an inferior viewing position. Earthwork associated with the construction of access roads and right-of-way clearing would be mostly screened but where visible, would produce geometric forms and curvilinear lines in the landform and vegetation. The proposed structures and conductors would be seen at approximately 0.25 mile in context with an existing 138kV transmission line and would introduce strong structure contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 8N	Location Sketch 
Key Observation Point # 63 Dispersed residences north of Craig	Range: 90W	
VRM Class/VQO: n/a	Section: 23	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Slightly concave to gently rolling, blocky/pyramidal	Low, amorphous and geometric patches, group/clumped areas	Rectangular, triangular
Line	Gently curving, horizontal, diagonal,	Strong diagonal butt edges	Horizontal, diagonal
Color	Browns/ tans	Greens, yellows, tans, sage, grays, reds	Grays, whites, reds, browns
Texture	Fine grain	Fine to coarse grain	Medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, thin; geometric, triangular
Line	n/a	n/a	Vertical/diagonal; thin concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



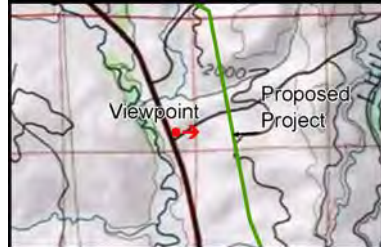
View northeast from Colorado State Route 13

Moderate contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting associated with a dispersed residence along Colorado State Route 13, north of Craig. The proposed Project would cross rolling terrain and be visible in a partially screened and backdropped condition. Construction access and tower pad disturbance to landform and vegetation would not be visible from this KOP due to topographic screening. The proposed Project structures and conductors would be visible at approximately 1 mile and introduce moderate structure contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 8N	Location Sketch 
Key Observation Point # 64 Access to Routt NF recreation	Range: 90W	
VRM Class/VQO: n/a	Section: 3	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rolling	Amorphous patches, stippled in areas	Weak, simple vertical
Line	Curving, diagonal, undulating horizontal	Curving butt (at road) and diffuse edges	Vertical, thin, straight
Color	Tan, beige, gray	Greens, tans, yellow sage	Light browns
Texture	Fine grain	Fine to medium grain, dense	Fine grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Minimal disturbance for geometric clearings for tower pads and access	Geometric patches of reestablished low vegetation on clearings	Bold, vertical; complex geometric/triangular
Line	Horizontal, gently undulating	Horizontal butt edge created at clearing	Vertical/diagonal; thin concave (conductors)
Color	Tans	Greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View east from Moffat County Road 27, Colorado

Strong contrast would result from the construction and operation of the proposed Project within this enclosed landscape setting. The proposed Project would cross rolling terrain in a partially backdropped condition from an access route for the Routt National Forest. Disturbance associated with construction access and tower pad earthwork would be intermittently visible and introduce moderate contrast to landform and vegetation elements of form and line with a weak contrast with color and texture as thin, broken horizontal and diagonal lines would be visible. The proposed structures and conductors would be seen at approximately 0.4 mile and introduce strong contrast in the structure elements of form, line, color and texture in a landscape with minimal disturbance and influence from existing structures. Minimizing slope cut and fill in steeper areas (selective mitigation #3) seen from this KOP would reduce contrast with existing landform and vegetation characteristics, however strong structure contrast would remain because of the skylined structures and conductors.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 10N	Location Sketch 
Key Observation Point # 66 Dispersed residence along Colorado State Highway 13	Range: 91W	
VRM Class/VQO: n/a	Section: 25	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat to rolling and blocky, low meandering band	Amorphous and geometric patches, stippled and clumped areas	Thin vertical, geometric/rectangular, triangular
Line	Curving, diagonal, horizontal	Straight, diagonal butt and diffuse edges	Vertical, horizontal, diagonal, weak concave/horizontal
Color	Tan, beige, blue-gray	Greens, sage, tan, yellow reds	Browns, grays, whites
Texture	Fine to medium, reflective, smooth	Fine to coarse	Medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Bold, vertical, rhythmic; complex geometric/triangular
Line	n/a	n/a	Vertical/diagonal, horizontal; concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View east from Colorado State Highway 13

Moderate/strong contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting associated with a dispersed residence along Colorado State Highway 13, north of Craig. The proposed Project would cross rolling terrain and would be viewed in both backdropped and skylined conditions. Construction access and tower pad disturbances to landform and vegetation would not be seen from this KOP due to topographic screening. The proposed Project structures and conductors would be visible at approximately 0.25 mile and introduce a strong structure contrast where skylined transmission structures would be viewed from an inferior position.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/28/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 12N	Location Sketch 
Key Observation Point # 67 Dispersed residences south of Baggs	Range: 92W	
VRM Class/VQO: n/a	Section: 20	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Indistinct, low, rolling, blocky	Geometric strips, low amorphous clump/groups	Thin low repeating vertical, geometric, rectangular, triangular
Line	Gently curving, horizontal, straight, diagonal, layered	Butt edges (at road and fence line)	Vertical, diagonal, horizontal
Color	Browns, tans, grays	Greens, tans, yellow	Subtle grays, browns, reds
Texture	Fine grain, smooth	Fine to medium grain	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical, rhythmic; complex geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns, tans, grays	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/28/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View west from Moffat County Road 4

Strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape associated with dispersed residences along Moffat County Road 4, southwest of Baggs, Wyoming. The proposed Project would traverse flat slopes paralleling the road and then cross perpendicular approximately 0.5 mile from this viewpoint. Earthwork associated with the construction of access roads as well as right-of-way clearing would be mostly screened but where visible, would produce geometric forms and curvilinear lines in the landform and vegetation. The proposed Project would be visible in the foreground out to approximately a 0.5 mile and introduce strong structure contrast where the structures and conductors would be skylined.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 12N	Location Sketch 
Key Observation Point # 73 Baggs residential	Range: 91W	
VRM Class/VQO: III	Section: 5	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat to low rugged, blocky, horizontal	Indistinct, some stippled areas	Geometric, rectangular, cylindrical, horizontal
Line	Irregular, angular, banding	Indistinct, diffuse	Horizontal, vertical, diagonal
Color	Browns, tans	Dull and dark green	Browns, grays, tans, reds, white
Texture	Medium to coarse grain	Fine to medium grain	Medium to coarse grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Thin, vertical
Line	n/a	n/a	Thin vertical
Color	n/a	n/a	Dull gray
Texture	n/a	n/a	Uniform repeating medium grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from Cowpoke Road, Baggs, Wyoming

Weak contrast would result from the construction and operation of the proposed Project in this panoramic landscape setting viewed from residences in Baggs, Wyoming of land designated as VRM Class III. The Project would be intermittently to fully screened by topography in the background with cultural modifications associated with rural development visible in the immediate foreground. In locations where the structures may be visible, only the top of the structures would be seen 2.4 miles away which would introduce weak structure contrast into the landscape.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/28/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6N	Location Sketch 
Key Observation Point # 83 Moffat County Road 57	Range: 95W	
VRM Class/VQO: n/a	Section: 16	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Indistinct, low, rolling	Indistinct, with areas of stippling	Vertical, geometric
Line	Gently curving, horizontal	Indistinct, weak diffuse edges and butt edge (at road)	Vertical/diagonal; thin concave (conductors)
Color	Browns, tans, grays (road)	Greens, tans, grays	Grays, transparent, brown
Texture	Fine grain, smooth	Fine to medium grain	Uniform medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, thin; geometric, triangular
Line	n/a	n/a	Vertical/diagonal; thin concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/28/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from Moffat County Road 57, Colorado

Moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting associated with views along Moffat County Road 57. The proposed Project would be viewed from a level position as it crosses flat terrain in a partially skylined condition. Modification of landform and vegetation patterns associated with construction access and tower pads would not be visible from this viewpoint. The proposed structures and conductors would be seen at approximately a 0.5 paralleling both an existing 345kV and 138kV transmission line. The proposed structures would be larger and closer to this KOP than the existing transmission lines, therefore, the proposed Project would introduce a moderate level of structure contrast. To reduce contrast on views from this road, selective mitigation measure #9 (maximize span length) would be applied to reduce dominance of structures being located adjacent to the road.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/4/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 8S Range: 24E Section: 34	Location Sketch 
Key Observation Point # 86 Utah State Route 45 (north of Bonanza)		
VRM Class/VQO: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat/slightly concave to gently rolling, small butte features	Low indistinct patches, stippled areas	Vertical, thin; geometric, triangular, cylindrical
Line	Continuous, horizontal, undulating, diagonal	Indistinct, weak diffuse edges	Vertical/diagonal; thin concave (conductors)
Color	Tans, grays, light brown	Sage greens, tans	Grays, transparent, browns
Texture	Fine to medium grain	Fine to medium grain	Medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin; geometric, triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Tans, grays, light brown	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/4/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



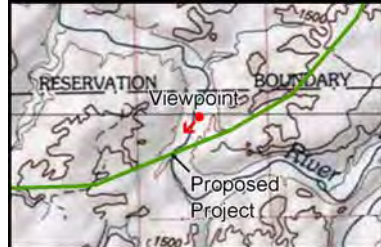
View southeast from Utah State Route 45 north of Bonanza

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated by the BLM as VRM Class III and viewed from Utah State Route 45. The proposed Project crosses rolling terrain and would be partially backdropped by adjacent terrain. Disturbance associated with construction access would introduce additional curvilinear lines and geometric forms into the landscape. Vegetation clearing would be limited to areas around tower pads and access roads, and these geometric forms would over time blend with existing vegetation patterns. The proposed structures would be seen at 0.6 mile in context with existing 345kV and 138kV transmission lines.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/25/2012
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 9S	Location Sketch 
Key Observation Point # 87 Enron Recreation Area (on White River)	Range: 22E	
VRM Class/VQO: III	Section: 28	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Horizontal, rolling to steep	Band along riparian corridor, stippled canyon walls	n/a
Line	Continuous, curving, flowing, horizontal, parallel	Butt edge between riparian vegetation and canyon wall	n/a
Color	Reflective, gray-green, browns, reds	Variety of greens, tans	n/a
Texture	Fine, glossy, rippled, medium to coarse grain canyon walls	Medium to coarse grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical; complex geometric/triangular
Line	Geometric, curvilinear	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns	Sage greens, tans	Dull gray, transparent
Texture	Fine	Fine grain	Coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/25/2012
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from Enron Recreation Area (White River), Utah

Strong contrast would result from the construction and operation of the proposed Project in an enclosed landscape setting associated with the Enron Recreation Area along the White River. The proposed Project would cross the White River through an area of rolling terrain and would be visible in a skylined condition from an inferior viewing position. Disturbance associated with the construction of access roads and tower pads would be visible and would produce a weak/moderate contrast with existing landform characteristics. Due to the low-growing vegetation crossed by the proposed Project, which would require limited vegetation clearing, contrast resulting from the modification of the vegetation's form, line, color, and texture would be weak. The proposed structures and conductors would be seen at approximately 0.25 mile and introduce strong structure contrast. Selective mitigation measures #2 (limit construction of new access roads), #3 (minimize ground disturbance), and #9 (maximize span length) would be applied to reduce contrast as viewed from this recreation area.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	8/24/2009
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 9S	Location Sketch 
Key Observation Point # 88 Fantasy Canyon	Range: 22E	
VRM Class/VQO: IV	Section: 1	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rugged, complex	Low, amorphous patches and stippled areas	Low, geometric
Line	Horizontal, diagonal, angular	Weak indistinct and diffuse edges	Diagonal, vertical
Color	Red-browns, tans, grays	Subtle, greens/yellows	Browns
Texture	Medium to coarse grain, striated	Fine grain	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	n/a
Line	n/a	n/a	n/a
Color	n/a	n/a	n/a
Texture	n/a	n/a	n/a

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	8/24/2009
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Fantasy Canyon parking area, Utah

Views of the proposed Project, located south of Fantasy Canyon, would be completely screened by topography. If the proposed Project were visible, it would be seen crossing land designated as VRM Class IV in an area developed by oil and gas extraction.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/10/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 7S	Location Sketch 
Key Observation Point # 100 Dispersed residences along Utah State Route 88	Range: 20E	
VRM Class/VQO: III	Section: 5	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat/slightly concave to gently rolling	FG: Rounded, pyramidal MG: Low indistinct patches,	Vertical, rhythmic; geometric/triangular
Line	Continuous, horizontal, undulating, simple	FG: Vertical, geometric MG: Indistinct, weak diffuse edges	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Tans, browns, reds, subtle	FG: Vibrant greens MG: Tans	Dull gray, transparent
Texture	Fine grain	FG: Fine to coarse grain MG: Fine to medium grain	Repeating medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Tans, browns	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

**Does project design meet visual
resource management objectives?**

Yes

**Additional mitigating measures
recommended?**

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/10/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from Utah State Route 88 adjacent to residence, Utah

Weak contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III and associated with a residence along Utah State Route 88. The proposed Project would cross relatively flat terrain with intermittent vegetation screening. Disturbance associated with construction access and tower pads would weakly contrast with the landform and vegetation elements of contrast since the thin horizontal lines from these disturbances are similar to lines present in the existing landscape character. The proposed Project structures and conductors would be visible at approximately one mile paralleling a transmission line with similar design characteristics.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 9/28/2011
BLM Field Office/National Forest: Vernal Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 4S	Location Sketch 
Key Observation Point # 103 Dinosaur Diamond SB (U.S. HWY 40 S of Bridgeland)	Range: 3W	
VRM Class/VQO: n/a	Section: 8	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat/rolling, rounded	Low, amorphous patches and stippled areas	Vertical, geometric
Line	Horizontal, undulating, continuous	Weak indistinct and diffuse edges	Vertical/diagonal; thin concave (conductors)
Color	Beige, tans	Subtle, greens, tans, bright greens along riparian corridor	Brown, gray
Texture	Medium grain	Fine to medium grain	Medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin; geometric, triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Beige, tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/28/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



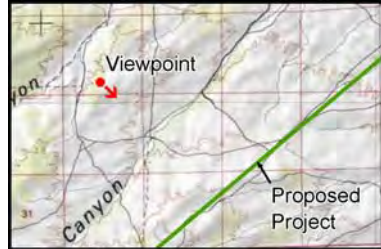
View east from U.S. Highway 40 east of Duchesne, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting as viewed from U.S. Highway 40. The proposed Project crosses rolling terrain in a partially backdropped condition. Weak vegetation contrast would occur as thin diagonal lines and geometric patches of cleared vegetation may be visible. The construction of access roads and tower pads would produce geometric forms and curvilinear lines which would minimally contrast with the rolling terrain viewed from this point. The proposed structures would be seen 0.7 mile away on the other side of an existing 138kV transmission line.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 5/21/2009
BLM Field Office/National Forest: Vernal Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 4S	Location Sketch 
Key Observation Point # 105 Dispersed residences south of Duchesne	Range: 4W	
VRM Class/VQO: n/a	Section: 20	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Horizontal, rounded	Amorphous patches	Vertical, thin
Line	Continuous, horizontal	Diffuse to butt edges from juniper stands	Thin vertical
Color	Tans	Light tan (grasses), dark green (juniper)	Brown
Texture	Fine to medium	Fine to patchy, coarse	Fine grain, sparse density, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal	Linear vegetation clearing in right-of-way	Thin, vertical
Line	Curvilinear, horizontal	Butt edge along edge of right-of-way	Thin, vertical; thin/weak concave (conductors)
Color	Tans	Light tan (grasses)	Dull gray
Texture	Fine grain	Fine grain	Uniform repeating medium grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	5/21/2009
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



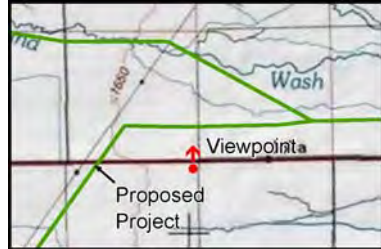
View southeast from residences south of Duchesne, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project, within a panoramic landscape as viewed from residences south of Duchesne. The proposed Project crosses rolling terrain and would be partially backdropped by adjacent terrain. Disturbance associated with construction access in addition to right-of-way vegetation clearing would introduce weak contrast due to the proposed Project being located approximately 2 miles away. The proposed structures would be seen adjacent to an existing 138kV transmission line and due to the distance from these viewers, would introduce a weak/moderate structure contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 3S	Location Sketch 
Key Observation Point # 107 Ioka residential	Range: 2W	
VRM Class/VQO: n/a	Section: 5	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal, slightly rolling, plateaus	Low and flat to tall, vertical	Tall, vertical, geometric, transparent
Line	Weak, horizontal	Regular, vertical, horizontal, butt edges	Complex, angular, concave, horizontal
Color	Browns, reds	Vivid greens, tans	Reflective, gray
Texture	Fine grain, smooth	Fine grained grasslands; dense, medium grained trees	Medium grain, sparse density, matted, uniform, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, flat	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Weak, horizontal	Vertical/diagonal; thin concave (conductors)
Color	Browns	Tans, gray-greens	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from 7000 West adjacent to residences in Ioka, Utah

Moderate contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting viewed from residences in Ioka, Utah. The proposed Project would cross relatively flat to slightly rolling terrain and would be partially backdropped by adjacent terrain. Disturbance associated with construction access roads and vegetation clearing in the right-of-way would be mostly screened by vegetation, but where visible would introduce additional geometric forms and curvilinear lines into the landscape. The proposed structures would be seen at 0.3 mile and in context with an existing 345kV transmission line. The proposed structures would introduce a moderate/strong structure contrast due to their proximity to this viewpoint.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 2S	Location Sketch 
Key Observation Point # 108 Dinosaur Diamond SB (U.S. HWY 40 SW of Roosevelt)	Range: 1W	
VRM Class/VQO: n/a	Section: 31	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat/rolling, rounded	Low, amorphous patches and stippled areas	Vertical, geometric, rectangular
Line	Horizontal, undulating, continuous	Weak indistinct and diffuse edges	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Beige, tans	Subtle, greens, tans, bright greens along riparian corridor and in	Brown, gray, blue, white
Texture	Medium grain	Fine to medium grain	Medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Beige, tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from U.S. Highway 40 southwest of Roosevelt, Utah

Weak contrast would result from the construction and operation of the proposed Project, within a panoramic landscape setting viewed from U.S. Highway 40. The proposed Project crosses rolling terrain and would be skylined as it crosses the plateau in the distance. Earthwork associated with construction access and tower pads would be visible and introduce thin diagonal lines and geometric pads on the plateau. Vegetation clearing in the right-of-way would be limited due to the low-growing vegetation and if seen, would introduce weak geometric vegetative forms. The proposed structures would be seen approximately 2 miles away adjacent to an existing 345kV transmission past an area of industrial development.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 7/25/2012
BLM Field Office/National Forest: Vernal Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 3S	Location Sketch 
Key Observation Point # 109 Dispersed residences south of Roosevelt	Range: 1E	
VRM Class/VQO: n/a	Section: 6	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal, terraces	Low, flat	Low, geometric
Line	Undulating, horizontal, angular	Regular, linear, butt edges	Vertical, angular, horizontal
Color	Red, brown	Vivid greens, tans	Reflective, gray, white
Texture	Stippled, patchy, matte	Dense, granular	Fine grain, matted, uniform, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal	Low, flat	Vertical, rhythmic and diminishing; geometric/triangular
Line	Curvilinear, horizontal	Regular, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Red, brown	Greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/25/2012
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from residences south of Roosevelt, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting from residences south of Roosevelt. The proposed Project would be mostly skylined as it traverses the land beyond the agricultural fields at the edge of the escarpment. Earthwork associated with the construction of access roads and right-of-way clearing would be mostly screened but where visible, would produce geometric forms and curvilinear lines in the landform and vegetation. The proposed structures would be seen at approximately 0.25 mile and due to separation between the proposed Project and the existing 345kV transmission line, the existing transmission line would be seen behind this viewpoint approximately 0.5 mile away. Due to the proximity of these residences to the proposed Project, structure contrast was assessed to be at a high level.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 2S	Location Sketch 
Key Observation Point # 110 Roosevelt residential	Range: 1W	
VRM Class/VQO: n/a	Section: 27	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal, plateaus	Low, flat	Vertical, geometric,
Line	Horizontal, angular	Regular, straight, horizontal	Complex, angular; thin/weak concave (conductors)
Color	Browns	Vivid greens, tans	Gray, transparent
Texture	Fine to medium grain	Dense, granular	Uniform medium grain, medium to sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin, triangular
Line	Geometric, curvilinear	Indistinct, broken, regular	Vertical/diagonal; thin/weak concave (conductors)
Color	Browns	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south adjacent to residences south of Roosevelt, Utah

Weak contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting as viewed from residences south of Roosevelt, Utah. The proposed Project crosses flat to gently rolling terrain and would be mostly backdropped by adjacent terrain. Disturbance associated with construction access and right-of-way vegetation clearing would be mostly screened by topography from this viewpoint but where visible, would introduce geometric forms which would weakly contrast with the existing landscape character. The proposed structures would be seen 1.4 miles away beyond an existing transmission line and would be partially screened by topography. Due to the dominance of the existing transmission line, the proposed Project would introduce a weak structure contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 2S	Location Sketch 
Key Observation Point # 111 Bottle Hollow Reservoir	Range: 1E	
VRM Class/VQO: n/a	Section: 28	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat/slightly rolling with terraces	Low indistinct patches, stippled areas	Vertical, thin; geometric, triangular
Line	Continuous, horizontal to angular, undulating	Indistinct, weak diffuse edges	Vertical/diagonal; thin concave (conductors)
Color	Tans, reds, light brown	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Uniform coarse grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin; geometric, triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Tans, reds, light brown	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from recreation area at the south side of Bottle Hollow Reservoir, UT

Weak contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting viewed from the Bottle Hollow recreation area. The proposed Project crosses rolling terrain and is located further from the viewer than the existing 345kV transmission line. Disturbance associated with construction access as well as vegetation clearing in the right-of-way would be mostly screened from view but where visible, would introduce curvilinear lines and geometric forms. The proposed structures would be seen approximately 1 mile away in a partially backdropped condition beyond an existing 345kV transmission line.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/10/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6S	Location Sketch 
Key Observation Point # 113 Utah State Route 88 (north of Leota)	Range: 20E	
VRM Class/VQO: III	Section: 21	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Gently rolling, jagged edges on edges of terraces	Low indistinct patches, stippled areas	Vertical, thin; geometric, triangular
Line	Continuous, horizontal, undulating, angular	Indistinct, weak diffuse edges	Complex, vertical/diagonal; thin concave (conductors)
Color	Tans, reds	Sage greens, tans	Reflective, gray
Texture	Medium grain	Fine to medium grain	Uniform coarse grain, medium density, repeating

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin; geometric, triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Tans, reds	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density, repeating

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/10/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southeast from Utah State Route 88 north of Pelican Lake

Weak contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III viewed from Utah State Route 88. The proposed Project crosses rolling terrain and due to the slightly superior viewing position, the proposed project would be backdropped. Disturbance associated with construction access and vegetation clearing within the right-of-way would be mostly screened by topography but where visible, would introduce weak contrast. The proposed structures would be seen partially screened 1.4 miles away, beyond an existing 345kV transmission line.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/26/2011
BLM Field Office/National Forest:	Fillmore Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 131 Mount Nebo Loop Scenic Byway	Range: 2E	
VRM Class/VQO: n/a	Section: 5	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Prominent, steep, undulating	Geometric and amorphous patches, stippled areas	Vertical, geometric
Line	Complex, diagonal, curving	Irregular butt and diffuse edges	Vertical/diagonal; thin concave (conductors)
Color	Tans	Variety of greens, tans, seasonal color	Reflective, gray, brown, transparent
Texture	Medium grain	Fine to medium grain	Medium grain, medium density, matted, uniform, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Bold, vertical; complex geometric/triangular
Line	Geometric, curvilinear	Angular, butt edge	Vertical/diagonal; thin concave (conductors)
Color	Tans	Tans, gray-greens	Dull gray, transparent
Texture	Fine texture	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/26/2011
BLM Field Office/National Forest:	Fillmore Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from intersection of Mount Nebo Scenic Byway and Utah State Route 132

Moderate contrast would result from the construction and operation of the proposed Project in an enclosed landscape setting viewed from the Mount Nebo Scenic Byway. The proposed Project would cross steep terrain and would be mostly backdropped by adjacent terrain. Disturbance associated with the construction of access roads and vegetation clearing within the right-of-way would introduce additional geometric forms into the landscape. The proposed structures would be seen at approximately 0.5 mile in context with existing 345kV and 138kV transmission lines from an inferior viewing position. Therefore, the structures would introduce moderate structure contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/5/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 21S	Location Sketch 
Key Observation Point # 145 Thompson Springs residential	Range: 20E	
VRM Class/VQO: n/a	Section: 21	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, smooth, Book Cliffs are prominent in view	Short, patchy	Low, geometric
Line	Horizontal	Angular, broken, diffuse edges	Horizontal, diagonal
Color	Tans, grays	Gray-greens, tans	White, browns
Texture	Fine grain	Even, medium grain	Medium grain

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Tans, grays	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/5/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from residences in Thompson Springs, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting as viewed from residences in Thompson Springs, Utah. The proposed Project crosses level to gently rolling terrain and would be backdropped by adjacent terrain. Disturbance associated with construction access as well as right-of-way vegetation clearing would be mostly screened by vegetation and where visible, would introduce weak horizontal lines and geometric forms in both the landform and vegetation components of this landscape. The proposed structures would be seen 0.3 mile away and due to this proximity, would introduce a strong structure contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/3/2011
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 1N	Location Sketch 
Key Observation Point # 147 Rangely residential	Range: 102W	
VRM Class/VQO: III	Section: 12	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Horizontal, rounded, blocky	Amorphous patches, stippled	Geometric, rectangular, triangular, thin vertical
Line	Undulating horizontal, diagonal	Diffuse and butt edges	Angular, vertical, horizontal
Color	Brown-tans	Tan, dark greens, sage	Dark browns, tans, whites
Texture	Fine grain	Fine to medium grain	Coarse grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Thin clearing for access road	Low thin strip of reestablished vegetation	Vertical, thin; geometric, triangular
Line	Horizontal, diagonal	Horizontal and diagonal butt edge created at clearing	Vertical/diagonal; thin concave (conductors)
Color	Brown-tan	Tans, greens	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/3/2011
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from La Mesa Circle, Rangely, Colorado

Weak/moderate contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting associated with residences in southeast Rangely, Colorado. The proposed Project would be seen from an inferior viewing position and would be mostly screened by topography. Disturbance associated with construction access roads and tower pads would also be mostly screened by topography but where visible, would weakly contrast with existing landform and vegetation characteristics. The proposed structures and conductors would be seen 0.7 mile away and would be almost entirely screened from view but where visible, would be skylined in a moderately modified landscape setting.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/27/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 5N	Location Sketch 
Key Observation Point # 150 Dinosaur National Monument (SE Entrance)	Range: 98W	
VRM Class/VQO: n/a	Section: 1	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Pyramidal, low rolling	Amorphous patches and strips	Vertical, geometric
Line	Undulating horizontal, curving band	Diffuse to butt edges	Vertical, diagonal, weak concave/horizontal
Color	Brown-tans, grays/black (road)	Light tans, yellow, dark green, and light greens	Browns, subtle grays
Texture	Fine to medium	Fine to medium	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical, rhythmic and diminishing; complex
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Brown-tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southeast from Deerlodge Road (Dinosaur National Monument), Colorado

Moderate to moderate/strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting as viewed from Deerlodge Road, which provides access into Dinosaur National Monument. The proposed Project would cross through level to rolling terrain in a partially skylined condition. Earthwork associated with construction access and tower pads would introduce both weak landform and vegetation contrast as these modifications would be similar to existing landscape character deviations. The transmission structures would be seen from approximately 0.5 mile away with two existing transmission lines located another 1 mile beyond the proposed Project and due to the proximity of the Project, structure contrast was assessed to be strong. To reduce contrast, selective mitigation measure #9 (maximize span length) would be applied to limit dominance of transmission structures being located adjacent to Deerlodge Road. It is important to note that two other route variations are under study in the Draft EIS and would introduce a weaker level of contrast. This weaker contrast is a result of these alternatives being located beyond the existing transmission line and therefore, the existing features would be more dominant from this viewing location than the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 19S	Location Sketch 
Key Observation Point # 152 I-70 Harley Dome Rest Area (Dinosaur Diamond SB)	Range: 25E	
VRM Class/VQO: III	Section: 2	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Shallow to moderate slopes, rounded	Indistinct, stippled	n/a
Line	Horizontal, diagonal, undulating	Indistinct, irregular	n/a
Color	Tans, reds, grays	Dark greens	n/a
Texture	Fine to medium grain	Medium grain, uneven/random	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from overlook at Harley Dome Rest Area, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting with VRM Class III designation and associated with the Harley Dome Rest Area that provides views of the Book Cliffs. The proposed Project would cross through rolling terrain in backdropped and intermittently screened conditions and would be viewed from a superior position. Disturbance associated with construction access and tower pads would have weak contrast with landform and vegetation elements of form, line, color, and texture due to the rolling terrain and low-growing vegetation. The proposed structures and conductors would be visible at 0.6 mile and would have moderate/strong contrast with existing structural elements in a natural landscape setting.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	Grand Junction Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 9S	Location Sketch 
Key Observation Point # 153 Mack residential	Range: 104W	
VRM Class/VQO: IV	Section: 28	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Shallow slopes, rugged in areas	Indistinct, patches, stippled	n/a
Line	Horizontal, broken diagonal	Indistinct	n/a
Color	Tans	Gray-greens	n/a
Texture	Fine to medium grain	Medium grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Minimal disturbance for geometric tower pads and access through flat	Thin horizontal band of low growing reestablished vegetation at tower	Bold, vertical, rhythmic; complex geometric/triangular
Line	Horizontal	Horizontal	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Tans, greens	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	Grand Junction Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from dispersed residences west of Mack, Colorado

Strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape with VRM Class IV designation and associated with a residences near Mack, Colorado. The proposed Project would be viewed in a skylined condition from a level position as it traverses through relatively flat terrain. Disturbance associated with construction access and tower pads as well as any right-of-way vegetation clearing would weakly contrast with existing landform and vegetation characteristics. The proposed structures and conductors would be seen 0.3 mile away and would strongly contrast with existing structural elements as they would be seen above the horizon in a setting with limited visible cultural modifications.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 17N	Location Sketch 
Key Observation Point # 177 Overland Trail historical monument (WY HWY 789)	Range: 92W	
VRM Class/VQO: IV	Section: 9	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Low, rolling	Low, amorphous patches	Thin, vertical
Line	Undulating, horizontal	Irregular, diffuse, indistinguishable to strong butt edge (at road)	Vertical, horizontal, weak horizontal
Color	Browns, tans, grays (road)	Greens, tans, grays	Light browns, subtle grays
Texture	Fine grain	Fine to medium grain	Fine grain, sparse

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, thin; geometric, triangular
Line	n/a	n/a	Vertical/diagonal; thin concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View east from Overland Trail Historic Marker on Wyoming 789

Moderate/strong contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting designated as VRM Class IV associated with views from the Overland Historic Trail as it crosses Wyoming 789. The proposed Project would be seen from a level position with intermittent to partially screened views of partially skylined structures and conductors through rolling terrain. Disturbance associated with construction access and tower pads would weakly contrast with existing landform and vegetation patterns. The proposed structures and conductors would be visible at approximately a 0.5 mile and would produce a moderate/strong structure contrast as portions of the project structures and conductors would be visible above the horizon. To reduce contrast, selective mitigation measure #9 (maximize span length) would be applied to limit dominance of transmission structures being located adjacent to the trail/historic marker.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/23/2012
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 21S	Location Sketch 
Key Observation Point # 193 I-70 Crescent Junction Rest Stop (Dinosaur Diamond SB)	Range: 19E	
VRM Class/VQO: III	Section: 33	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Bold, vertical, horizontal, rolling, rugged, plateaus	Few, stippled	Geometric, vertical
Line	Parallel, horizontal, curving, diagonal, angular	Weak diffuse, indistinct	Straight, horizontal
Color	Tans, grays, reds	Tans, greens	Light tan, brown, gray
Texture	Banded, medium to coarse grain	Fine grain	Medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin; geometric, triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/23/2012
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from picnic area at Crescent Junction Rest Area, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting with VRM Class III designation and associated with the Crescent Junction Rest Area that provides views of the Book Cliffs. The proposed Project would cross through rolling terrain in a backdropped condition and would be viewed from a superior position. Disturbance associated with construction access and tower pads would produce a weak contrast due to the flat terrain and low-growing existing vegetation communities. The proposed structures and conductors would be visible at approximately 1 mile and would have moderate contrast due to the number of existing structures located closer to the viewpoint than the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 16S	Location Sketch 
Key Observation Point # 194 Potters Ponds	Range: 6E	
VRM Class/VQO: Partial Retention	Section: 8	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Diagonal, bold, rounded, level ridgeline	Vertical, complex, pyramidal, amorphous	n/a
Line	Curving, continuous, horizontal	Flowing, complex, irregular	n/a
Color	Tans	Vivid, greens, tans, seasonal variation	n/a
Texture	Medium to coarse grain	Coarse, stippled, scattered	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, thin; geometric, triangular
Line	Geometric, curvilinear	Angular, butt edge	Vertical/diagonal; thin concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

**Does project design meet visual
resource management objectives?**

No

**Additional mitigating measures
recommended?**

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View east from Potters Pond, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting designated by the Manti-La Sal NF as a partial retention VQO. The proposed Project crosses moderately steep terrain and would be backdropped by adjacent terrain. Disturbance associated with construction access would introduce curvilinear lines into the landscape as roads would be built to access towers on moderately steep slopes. Vegetation clearing within the right-of-way would create geometric forms and a butt edge in the vegetation. The proposed structures would be seen at approximately 0.75 mile and introduce a strong structure contrast. Through the application of selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing), contrast associated with the proposed Project would be reduced.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 9/27/2011
BLM Field Office/National Forest: Manti-La Sal National Forest
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 16S	Location Sketch 
Key Observation Point # 195 Indian Creek Campground	Range: 6E	
VRM Class/VQO: Partial Retention	Section: 10	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Diagonal, bold, rounded	Vertical, complex, pyramidal, amorphous	Vertical, geometric
Line	Curving, continuous	Flowing, complex, irregular	Complex, angular
Color	Tans, grays	Vivid, greens, tans, seasonal variation	Gray, transparent
Texture	Medium to coarse grain	Coarse grain, dense	Medium grain, sparse density, matted, uniform

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Angular, bold, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Indian Creek Campground, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project in an enclosed landscape setting viewed from the Indian Creek Campground within lands designated by the Manti-La Sal NF as a partial retention VQO. The proposed Project would cross steep terrain as it descends into the Wasatch Plateau Park landscape where level to rolling terrain would be traversed. Disturbance associated with the construction of access roads and vegetation clearing in the right-of-way would be mostly screened by vegetation except on steep terrain across the Wasatch Plateau landscape. In this area, these disturbances would introduce additional geometric forms in the landscape generating a moderate/strong contrast. The proposed structures would be seen from 0.3 mile away and would be skylined above the trees in the foreground. Through modification of the proposed structure type in this area, shorter H-frame structures would be utilized to reduce the dominance of skylined structures. Selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would also be applied to reduce landscape contrast where the proposed Project traverses steeper terrain.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 9/27/2011
BLM Field Office/National Forest: Manti-La Sal National Forest
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 196 Fairview Lakes residential	Range: 5E	
VRM Class/VQO: Partial Retention	Section: 36	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Wide trough-shaped, rolling, rounded	Vertical, complex, pyramidal, amorphous patches	Low, geometric
Line	Curving, continuous, diagonal	Flowing, complex, irregular, butt edges	Angular, vertical
Color	Tans	Vivid, greens, tans, seasonal variation	Browns and greens
Texture	Fine to medium grain	Medium to coarse grain	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, thin, triangular
Line	Geometric, curvilinear	Angular, butt edge	Vertical/diagonal; thin/weak concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Uniform medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from residences north of the Fairview Lakes, Utah

Weak/moderate to moderate contrast would result from the construction and operation of the proposed Project in an enclosed landscape setting designated by the Manti-La Sal NF as a partial retention VQO as viewed from residences adjacent to Fairview Lakes. The proposed Project would cross moderately steep terrain and would be backdropped by adjacent terrain. Disturbance generated from the construction of access roads tower pads as well as right-of-way vegetation clearing would primarily be screened by vegetation except where the proposed Project crosses the saddle between the two mountains on the east side of the valley. In this location, these disturbances would develop a weak/moderate landscape contrast through the introduction of geometric forms and curvilinear lines incongruent with the existing landscape character. The proposed structures would be seen at approximately 1.8 miles in a level to slightly inferior viewer position and would produce a moderate level of structure contrast. To reduce contrast, selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would be applied.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/6/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 22N	Location Sketch 
Key Observation Point # 197 Hanna residential	Range: 81W	
VRM Class/VQO: n/a	Section: 20	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Indistinct, low, rolling	Tall pyramidal, low amorphous patch	Vertical, geometric, rectangular (homes)
Line	Gently undulating, horizontal	Indistinct, weak diffuse edges	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns, tans, grays (road)	Greens, tans	Grays and browns, varying color (homes)
Texture	Fine grain, smooth	Coarse to fine grain	Medium density and grain

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Geometric, thin horizontal clearing(s) for tower pads and	Cleared geometric, horizontal clearings for tower pads and access	Bold, vertical, rhythmic and diminishing; complex
Line	Diagonal, horizontal and undulating	Creating butt edge(s) at clearings	Vertical/diagonal, horizontal; concave (conductors)
Color	Contrasting tans from soil disturbance for clearings	Greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/6/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from Linda Drive, Hanna, Wyoming

Moderate/strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting associated with residences in Hanna, Wyoming. The proposed Project would cross through rolling terrain in a skylined condition. Disturbance associated with construction access and tower pads would weakly contrast with the existing landform's form, line, color, and texture. Weak contrast with existing vegetation patterns would occur because after revegetation, the areas cleared for construction would begin to blend with the existing low-growing vegetation. The proposed structures and conductors would be seen at approximately 0.5 mile as it parallels an existing transmission line. The proposed structures would be much larger than the existing; therefore, would strongly contrast with the existing structural elements in the landscape.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/6/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 22N	Location Sketch 
Key Observation Point # 198 U.S. Highway 30 (east of Hanna)	Range: 80W	
VRM Class/VQO: IV	Section: 7	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Indistinct, low, rolling	Indistinct, amorphous and geometric patches	Vertical, geometric
Line	Gently curving, undulating horizontal	Butt and weak diffuse edges	Vertical/diagonal; thin/weak concave (conductors)
Color	Browns, tans, grays (roads)	Greens, tans, grays, yellow	Brown, gray
Texture	Fine grain, smooth	Fine to medium grain	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, thin, triangular
Line	n/a	n/a	Vertical/diagonal; thin/weak concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/6/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from U.S. Highway 30, Wyoming

Weak/moderate contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting associated with U.S. Highway 30. The proposed Project would be seen from a level position with intermittent screening with portions of structures and conductors skylined through rolling terrain. Disturbance associated with construction access and tower pads would not be visible from this KOP. The proposed structures and conductors would be visible at approximately 1.5 miles and would generate a weak/moderate structure contrast as portions of the project structures would be visible above the horizon behind an existing 230kV transmission line. To reduce contrast, selective mitigation measure #9 (maximize span length) would be applied to decrease dominance of transmission structures being located adjacent to the highway.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 7/24/2012
BLM Field Office/National Forest: Vernal Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 11S	Location Sketch 
Key Observation Point # 200 Argyle Canyon Road	Range: 13E	
VRM Class/VQO: III	Section: 27	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	V-shaped, bold, steep, level valley	Numerous, irregular	n/a
Line	Diagonal, angular, jagged, horizontal	Broken, flowing, angular	n/a
Color	Tans and grays	Variety of greens, tans, little seasonal variation	n/a
Texture	Medium, granular, fine grain in valley	Random, scattered, fine to medium grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal, pyramidal	Low, rectangular clearings (tower pads)	Bold, vertical, rhythmic and diminishing; complex
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans and grays	Tans, gray-greens	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Repeating/diminishing coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/24/2012
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View east from Argyle Canyon Road, Utah

Strong contrast would result from the construction and operation of the proposed Project within this enclosed landscape setting designated as VRM Class III viewed from Argyle Canyon Road. The proposed Project would be located where the flat valley floor meets the steep side slopes of the canyon. Disturbance associated with right-of-way clearing would be minimal due to the low-growing vegetation present along the valley floor. The proposed structures, located less than 0.25 mile away, would become a dominant feature and produce an ordered, rhythmic element in this landscape. Due to the proximity to the viewer, the proposed Project would not be compliant with the definition of BLM VRM Class III. There are limited opportunities to mitigate the proposed Project as any adjustment of the alignment would move the proposed Project into extremely steep terrain which would further increase visual contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/5/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 21S	Location Sketch 
Key Observation Point # 201 Crystal Geyser	Range: 16E	
VRM Class/VQO: III	Section: 34	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Curving band (river), rolling to level	Continuous strip of riparian vegetation, stippled	Vertical, geometric
Line	Complex, diagonal, horizontal	Undulating, weak, diffuse edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns, tans, reds	Variety of greens, browns	Brown, gray
Texture	Rippled to smooth, glossy (river), rough, striated	Fine to medium grain (river corridor), sparse, medium grain	Repeating coarse to medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic and diminishing; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns, tans, reds	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/5/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



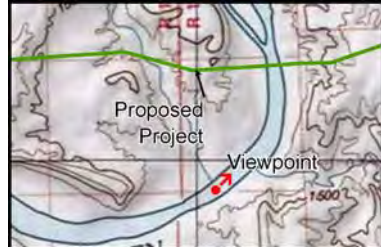
View southwest from Crystal Geyser, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III and viewed from Crystal Geyser. The proposed Project traverses gently rolling terrain and due to the low-growing vegetation in the right-of-way, contrast from vegetation clearing would be minimal. Construction access roads would introduce curvilinear lines into the landscape that would produce a weak/moderate landscape contrast. The proposed structures would be seen approximately 0.5 mile away in a skylined condition adjacent to an existing 345kV transmission line.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 7/25/2012
BLM Field Office/National Forest: Vernal Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 10S	Location Sketch 
Key Observation Point # 203 Fourmile Bottom	Range: 19E	
VRM Class/VQO: II	Section: 19	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Bold, domed, rolling to rugged	Typically low except for scattered trees in riparian corridor	n/a
Line	Undulating, angular, diagonal, horizontal	Undulating, continuous in along river; indistinct on hills	n/a
Color	Tans, browns	Variety of greens, subtle tans	n/a
Texture	Medium to coarse grain	Fine to medium grain, dense in riparian corridor, sparse and	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical; geometric/triangular
Line	Geometric, curvilinear	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, browns	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/25/2012
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from Fourmile Bottom adjacent to the Green River, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project in a landscape setting designated as VRM Class II as viewed from the Fourmile Bottom River Access Area on the Green River. The proposed Project would traverse moderately steep rolling terrain and would be skylined as it crosses the canyon ridgeline. Disturbance associated with construction access and grading of tower pads would introduce a weak/moderate contrast due to the geometric forms created by these project features. Due to the limited amount of vegetation clearing that would be seen from this KOP, contrast associated with the modification of vegetation patterns would be weak. The proposed structures would be seen at approximately 0.75 mile and would dominate views since there are few structural elements in the landscape. The application of selective mitigation measures #3 (minimize ground disturbance) and #9 (maximize span length) would reduce contrast generated by the proposed Project as viewed from the Green River.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/26/2011
BLM Field Office/National Forest:	Fillmore Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 12S	Location Sketch 
Key Observation Point # 204 Nephi residential	Range: 1E	
VRM Class/VQO: n/a	Section: 33	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Diagonal, moderately steep, rolling	Amorphous and geometric patches	Vertical, geometric
Line	Undulating, diagonal, curving	Butt and diffuse edges	Complex, angular
Color	Tans	Dark greens, tans	Brown
Texture	Medium grain, continuous	Medium grain, dense to sparse	Medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, rhythmic; geometric/triangular
Line	Geometric, curvilinear	Angular, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/26/2011
BLM Field Office/National Forest:	Fillmore Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View east from residences along 1450 North in Nephi, Utah

Moderate contrast would result from the construction of the proposed Project within an enclosed landscape setting as viewed from residences within Nephi, Utah. The proposed Project would cross steep terrain and would be partially skylined across the foothills landscape. Disturbance associated with construction access roads and clearing of vegetation within the right-of-way would introduce additional geometric forms into the landscape. The proposed structures would be seen 0.6 mile away from an inferior viewing position in context with existing transmission lines. Due to the proximity of the existing transmission lines, a weak/moderate structure contrast is anticipated from this viewpoint. Selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would reduce landscape contrast produced by the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/26/2011
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 14S	Location Sketch 
Key Observation Point # 205 Fountain Green residential	Range: 3E	
VRM Class/VQO: III	Section: 6	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Domed, rolling, undulating	Stippled areas and amorphous patches	Low, geometric
Line	Curving, angular	Butt to diffuse edges	Horizontal, diagonal
Color	Tans, reds	Dark greens, gray-green, tans	Grays, browns
Texture	Medium grain	Fine to medium grain	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, thin, triangular
Line	Geometric, curvilinear	Angular, butt edge	Vertical/diagonal; thin/weak concave (conductors)
Color	Tans, reds	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Uniform medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/26/2011
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View east from residences on east side of Fountain Green, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III viewed from residences in Fountain Green. The proposed Project crosses moderately steep terrain and would be backdropped by the adjacent terrain. Disturbance related to the construction of access roads and clearing of vegetation in the right-of-way would be partially screened by terrain in the foreground but where visible, would produce weak/moderate landscape contrast. The proposed structures would be viewed from an inferior viewing position approximately 1.5 miles away in context with an existing 345kV and 138kV transmission line.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/26/2011
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 14S	Location Sketch 
Key Observation Point # 206 Dispersed residences north of Mt. Pleasant	Range: 4E	
VRM Class/VQO: n/a	Section: 26	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat/slightly concave to gently rolling	Low distinct patches, with areas of stippling	Weak vertical, geometric
Line	Continuous, horizontal, undulating, simple	Butt edges between agricultural fields,	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, browns	Greens, tans	Tans, whites, browns
Texture	Fine grain	Fine to medium grain	Fine grain, medium density, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical, rhythmic; complex geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, browns	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/26/2011
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



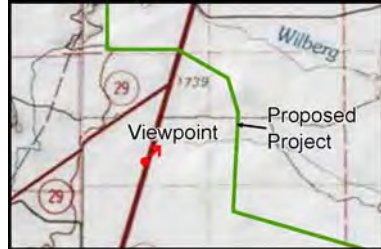
View south from road adjacent to residence north of Mount Pleasant, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project, within a panoramic landscape setting as viewed from residences north of Mount Pleasant. The proposed Project crosses flat to gently rolling terrain and would be partially backdropped by adjacent terrain. Disturbance associated with construction access and right-of-way clearing would be mostly screened by topography but where visible, would introduce geometric forms and curvilinear lines into the landscape. The proposed structures would be seen at approximately 0.5 mile with an existing 345kV transmission line visible 0.8 mile away. The proposed Project would introduce moderate to moderate/strong structure contrast due to the proximity of the proposed Project to these viewers with unobstructed views.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 18S	Location Sketch 
Key Observation Point # 207 Dispersed residences northeast of Castle Dale	Range: 8E	
VRM Class/VQO: n/a	Section: 23	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Shallow slopes, level to rolling slopes	Indistinct, patches, stippled	Geometric, transparent
Line	Horizontal, broken diagonal	Indistinct, diffuse edges	Vertical, horizontal; concave (conductors)
Color	Tans	Gray-greens, yellows, tans	Dull gray, transparent
Texture	Fine to medium grain	Medium grain	Medium grain, medium density, matted, uniform, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic ; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from residence along Utah State Route 10, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting associated with views from residences northeast of Castle Dale. The proposed Project would cross flat terrain and would be partially backdropped by adjacent terrain. Disturbance generated by construction access roads and tower pads as well as right-of-way vegetation clearing would mostly be screened from view but where visible, would introduce geometric forms and curvilinear lines into the landscape. The proposed structures would be seen 0.6 mile away in context with two existing 345kV transmission lines.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/23/2012
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 208 west Helper residential	Range: 9E	
VRM Class/VQO: n/a	Section: 23	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	FG: Plateaus, level BG: Bold vertical, horizontal, rugged	Amorphous masses, stippled areas	Geometric, vertical
Line	Vertical, diagonal, angular	Weak, diffuse, indistinct	Vertical/diagonal; thin concave (conductors)
Color	Tans, grays, reds	Dark greens	Brown
Texture	Banded, coarse grain	Fine to medium grain	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Stippled vegetation	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Diffuse edge	Vertical/diagonal; thin concave (conductors)
Color	Tans, grays, reds	Tans, gray-greens	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/23/2012
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from residences on the west side of Helper, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project within a focal landscape viewed from residences located along the west side of Helper, Utah. The proposed Project crosses rolling terrain and would be partially backdropped by adjacent terrain. Disturbance associated with construction access would introduce additional curvilinear lines and geometric forms into the landscape. Clearing of vegetation within the right-of-way would be mostly screened from view but where visible, would produce geometric forms incongruent with existing vegetation patterns. The proposed structures would be seen at 0.3 mile and due to the proximity to the viewers, would introduce a strong structure contrast even though the proposed Project would be seen in context with an existing small transmission line and railroad line. Skylined structures would be viewed on the distant ridge adjacent to the existing transmission line as well as skylined over the rooflines of residences viewed from this location. Due to the scattered residences located further up the canyon, there are limited opportunities to mitigate the proposed Project through an adjustment of the centerline without transferring impacts to another group of residences. To reduce contrast, selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would be applied but these would not reduce contrast associated with the introduction of the additional transmission structures.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 5/2/2013
BLM Field Office/National Forest: White River Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 3N	Location Sketch 
Key Observation Point # 210 Dinosaur residential	Range: 103W	
VRM Class/VQO: III	Section: 7	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat/slightly concave to gently rolling	Low indistinct and geometric patches, stippled and clumped areas	Vertical, geometric, rectangular
Line	Continuous, horizontal, undulating, simple	Indistinct, weak diffuse and butt edges	Vertical, horizontal
Color	Light gray, tans, light brown, subtle	Sage, greens, tans	Subtle grays, browns greens, whites
Texture	Fine grain	Fine to medium grain	Medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, thin; geometric, triangular
Line	n/a	n/a	Vertical/diagonal; thin concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform coarse grain, medium density

Degree of Contrast

Degree of Contrast		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	5/2/2013
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Brachiosaurus Street, Dinosaur, Colorado

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting with VRM Class III designation and associated with residential views from Dinosaur, Colorado. The proposed Project would cross low rolling terrain in a partially backdropped condition. Construction access and tower pad disturbance to landform and vegetation would not be visible from the KOP. The proposed structures and conductors would be seen at approximately 1 mile paralleling an existing transmission line. The proposed structures would be larger and introduce moderate contrast due to the relative scale when compared to the existing transmission line structures.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/26/2011
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 3N	Location Sketch 
Key Observation Point # 211 Dinosaur National Monument Visitor Center	Range: 103W	
VRM Class/VQO: III	Section: 8	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat gently rolling, layered horizontal	Low indistinct patches, stippled and clumped in areas	Thin vertical, geometric, rectangular
Line	Horizontal, undulating, simple	Indistinct, weak diffuse edges and butt edges	Vertical, horizontal
Color	Tans, light brown, gray, black	Sage, greens, tans, yellow	Grays, brown
Texture	Fine grain	Fine to medium grain	Coarse grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, rhythmic and diminishing; geometric/triangular
Line	n/a	n/a	Vertical/diagonal, horizontal; weak concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/26/2011
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Canyon Visitor Center for Dinosaur National Monument, Colorado

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III and associated with views from the Canyon Visitor Center at Dinosaur National Monument. The proposed Project would cross low rolling terrain in a skylined condition. Construction access and tower pad disturbance to landform and vegetation would not be visible from the KOP. The proposed Project structures and conductors would be seen at approximately 1.3 miles and introduce a moderate structure contrast. The proposed Project would parallel an existing transmission line, but the existing transmission is backdropped and intermittently screened while the proposed Project would be viewed in an unobstructed and skylined condition.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/26/2011
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 212 Fairview residential	Range: 4E	
VRM Class/VQO: n/a	Section: 36	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Level, undulating, rolling	Vertical, amorphous patches, stippled areas	Thin, geometric
Line	Diagonal, curving	Flowing, complex, diffuse and butt edges	Vertical, horizontal
Color	Tans, whites	Greens, tans, seasonal variation	Browns
Texture	Medium to fine grain	Medium grain	Medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, thin, triangular
Line	Geometric, curvilinear	Angular, butt edge	Vertical/diagonal; thin/weak concave (conductors)
Color	Tans, whites	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Uniform medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/26/2011
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from Utah State Route 31 adjacent to residences east of Fairview, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting as viewed from residences east of Fairview. The proposed Project crosses steep terrain and would be backdropped by adjacent terrain. Disturbances related to construction of access roads and clearing of vegetation in the right-of-way would be partially screened by vegetation in the foreground. Where visible, these elements would produce a moderate to moderate/strong landscape contrast through the introduction of geometric forms and curvilinear lines. The proposed structures would be seen from an inferior viewer position 1.2 miles away. Application of selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would reduce landscape contrast produced by access road construction and right-of-way vegetation clearing.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/27/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 213 Clear Creek residential	Range: 7E	
VRM Class/VQO: n/a	Section: 33	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Diagonal, bold, rounded	Vertical, complex, pyramidal, amorphous	Geometric, horizontal, rectangular
Line	Curving, continuous	Flowing, complex, irregular	Vertical, angular, regular
Color	Tans, grays	Vivid, yellow, greens, seasonal variety	Brown, gray
Texture	Medium grain	Coarse, stippled, scattered	Coarse grain, sparse density, uniform

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Bold, vertical; complex geometric/triangular
Line	n/a	n/a	Vertical/diagonal; thin concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from Clear Creek Residences, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting from residences in Clear Creek. The proposed Project crosses steep terrain and would be partially backdropped by adjacent terrain. Disturbance associated with construction access and right-of-clearing would be screened by topography and vegetation; therefore, disturbance to these features would not be visible from this KOP. The proposed structures would be seen at approximately 0.5 mile with a small distribution power line in the foreground. Selective mitigation measure #9 (maximize span length) would reduce contrast by limiting the number of towers visible from this viewpoint by spacing the towers as far apart as practicable at the canyon crossing.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/26/2012
BLM Field Office/National Forest:	Fillmore Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 214 Utah State Route 132 (north of Fountain Green)	Range: 2E	
VRM Class/VQO: n/a	Section: 10	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rolling, smooth, Mount Nebo is prominent in background	Stippled and loose amorphous patches	n/a
Line	Smooth, angular, simple, horizontal	Diffuse edges, irregular	n/a
Color	Tans	Dark greens, sage greens, tans, grays	n/a
Texture	Medium grain	Fine to medium grain, uneven/random	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/26/2012
BLM Field Office/National Forest:	Fillmore Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from Utah State Route 132 north of Fountain Green

Moderate contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting as viewed from Utah State Route 132. The proposed Project traverses moderately steep slopes and would be located along the top of the ridge, but would be backdropped by Mount Nebo in the background. Disturbance associated with construction access and vegetation clearing in the right-of-way would be mostly screened from view at this location but where visible, would introduce weak geometric forms. The proposed structures would be seen 1.2 miles away with views of the existing transmission lines screened by topography; therefore, a moderate structure contrast would be produced by the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/26/2011
BLM Field Office/National Forest:	Fillmore Field Office
Resource Area:	
Activity (program):	345kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 11S	Location Sketch 
Key Observation Point # 215 Mona residential	Range: 1E	
VRM Class/VQO: III	Section: 31	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, slightly concave	Low geometric patches, stippled areas	Vertical, geometric
Line	Continuous, horizontal	Diagonal, horizontal, butt edges	Vertical/diagonal; thin/weak concave (conductors)
Color	Grays, tans	Dark greens, bright greens, gray-greens, yellow, light brown	Grays, browns, tans
Texture	Uniform, fine grain	Fine to medium grain	Medium to coarse grain, medium density, matted, uniform, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin, triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin/weak concave (conductors)
Color	Tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/26/2011
BLM Field Office/National Forest:	Fillmore Field Office
Resource Area:	
Activity (program):	345kV Transmission Project



View west from residences in Mona, Utah

Weak contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting associated with residences in Mona, Utah. The proposed Project would be seen in a backdropped condition from a level viewing position as the proposed Project traverses through relatively flat terrain. Disturbance associated with construction access and tower pads would weakly contrast with existing landform and vegetation elements of form, line, color, and texture due to the level terrain and the low-growing vegetation. The proposed structures and conductors would be visible approximately 2 miles away and would weakly contrast with existing structural elements as existing transmission lines with similar design characteristics and energy generation facilities occur within this view.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/3/2011
BLM Field Office/National Forest:	Uinta National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 10S	Location Sketch 
Key Observation Point # 216 U.S. Highway 6 (west of Soldier Summit)	Range: 6E	
VRM Class/VQO: Partial Retention	Section: 16	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	V-shaped, bold, rugged	Stippled areas on slopes, amorphous patches	Vertical, geometric
Line	Diagonal, hard	Diffuse edges, irregular	Vertical; thin concave (conductors)
Color	Grays, reds	Dark greens, tans	Grays, transparent, browns
Texture	Medium to coarse grain, smooth surface texture	Medium to coarse grain, uneven/random	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Bold, vertical; complex geometric/triangular
Line	n/a	n/a	Vertical/diagonal; thin concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/3/2011
BLM Field Office/National Forest:	Uinta National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View east from U.S. Highway 6 west of Solider Summit, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting in land designated by the Uinta-Wasatch-Cache National Forest as a partial retention VQO and viewed from U.S. Highway 6. The proposed Project crosses flat to gently rolling terrain and would be partially skylined as it crosses along the steep terrain located to the north of the highway. Disturbances associated with construction access and right-of-way vegetation clearing would be screened by topography from this location. The proposed structures would be seen approximately 0.5 mile away from an inferior viewing position in context with three existing transmission lines (two 345kV and one 138kV).

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 15S	Location Sketch 
Key Observation Point # 217 Skyline Drive Scenic Backway	Range: 5E	
VRM Class/VQO: Partial Retention	Section: 24	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Bold, diagonal, solid	Stippled areas, amorphous patches	n/a
Line	Diagonal, flowing, bold	Butt edges	n/a
Color	Tans, grays	Variety of greens, tans, grays	n/a
Texture	Coarse grain	Medium to coarse grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, rhythmic; geometric/triangular
Line	Geometric, curvilinear	Angular, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from Skyline Drive Scenic Backway, Utah

Moderate/strong to strong contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting designated by the Manti-La Sal National Forest as a partial retention VQO. The proposed Project crosses steep terrain and would be partially backdropped by adjacent terrain. Disturbance associated with construction access would produce curvilinear lines and large geometric forms in the landscape through associated earthwork. Areas of right-of-way vegetation clearing would introduce geometric vegetation patterns incongruent with the existing landscape character. The proposed structures would be seen 0.3 mile away from this location where the existing 345kV transmission line would not be visible. By relocating the proposed Project to be adjacent to the existing transmission line, through the application of selective mitigation measure #7, views of the proposed Project would be mostly screened from this viewpoint. To further reduce contrast, selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would be applied.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 19S Range: 9E Section: 1	Location Sketch 
Key Observation Point # 218 Wedge Overlook Scenic Backway		
VRM Class/VQO: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Shallow slopes, undulating, rugged edge	Indistinct, patches, stippled, mottled	Vertical, geometric
Line	Diagonal, horizontal, undulating	Indistinct	Vertical, concave
Color	Tans, grays	Tans, gray-greens	Brown
Texture	Medium grain	Medium grain	Medium grain, medium density, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical, rhythmic and diminishing; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, grays	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



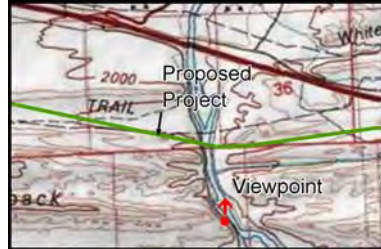
View northeast from Wedge Overlook Scenic Backway, Utah

Moderate to moderate/strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III viewed from the Wedge Overlook Scenic Backway. The proposed Project crosses rolling terrain and would be skylined from a slightly inferior viewer position. Disturbance associated with construction access would introduce a horizontal line and geometric forms into the landscape. Vegetation clearing would be limited to tower pads and access roads, which would introduce additional geometric forms contrasting with existing vegetation patterns. The proposed structures would be seen approximately 0.5 mile away introducing several skylined transmission structures and therefore, producing a moderate/strong structure contrast when compared to the small existing power line adjacent to the roadway. To effectively mitigate contrast on views from this scenic backway, the proposed Project would need to be located further to the north which would place the proposed Project outside of the designated utility corridor.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/7/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 20N	Location Sketch 
Key Observation Point # 220 North Platte River SRMA	Range: 85W	
VRM Class/VQO: III	Section: 3	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Low, rugged, blocky and flat (river)	Indistinct, some stippled areas and amorphous patches/strips	n/a
Line	Irregular, angular, banding and horizontal	Indistinct, diffuse and strong, irregular (butt edge along banks of	n/a
Color	Browns, tans, bluish-gray	Dull and dark greens, yellows	n/a
Texture	Medium to coarse grain and smooth, rippled, reflective	Fine to coarse grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Browns, tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/7/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from CR 347, Rochelle Public Access Area of the North Platte River, Wyoming

Moderate contrast would result from the construction and operation of the proposed Project in a feature/focal landscape setting associated with the Rochelle Public Access Area on the North Platte River with VRM Class IV designation. The proposed Project would be seen from a slightly inferior view as the proposed Project crosses rolling terrain in a partially backdropped and partially skylined condition. Disturbance associated with construction of access roads and tower pads would have a weak contrast with existing landforms since the majority of these ground disturbing activities would be screened from view. Weak contrast with existing vegetation patterns would occur because clearing of low-growing vegetation for access roads and tower pads would mostly be screened from view. The proposed structures and conductors would be seen 0.5 mile away and would have moderate/strong contrast with the existing landscape's structural elements due to partial topographic screening which would reduce the dominance of these structures. To further reduce contrast, selective mitigation measures #3 (minimize ground disturbance) and #9 (maximize span length) would be applied.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 5/3/2013
BLM Field Office/National Forest: Rawlins Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 23N	Location Sketch 
Key Observation Point # 222 Hanna Draw Road	Range: 81W	
VRM Class/VQO: IV	Section: 20	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Low, rugged, blocky	Indistinct, some stippled areas and amorphous patches	n/a
Line	Irregular, angular, curving, banding	Indistinct, diffuse and butt edge (at road)	n/a
Color	Browns, tans, reddish grays (gravel road)	Dull and dark greens, tans, yellow	n/a
Texture	Fine to medium grain	Medium grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Geometric clearing for tower pad and access	Cleared geometric portions for tower pads and access	Bold, vertical; complex geometric/triangular
Line	Horizontal, diagonal	Creating straight, diagonal butt edges at clearings	Vertical/diagonal, horizontal; concave (conductors)
Color	Contrasting tan from soil disturbance for clearings	Remaining low growing vegetation, greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	5/3/2013
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from Hanna Draw Road, Wyoming

Strong contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting viewed from Hanna Draw Road. The proposed Project would cross moderately steep to rolling terrain. Disturbance from the construction of access roads and tower pads would moderately contrast with the existing landforms. Weak/moderate contrast with existing vegetation patterns would occur because after revegetation, the areas cleared for construction would begin to blend with the existing low-growing vegetation. The proposed structures and conductors would be visible at approximately 0.5 mile and introduce strong structure contrast as several structures would be skylined. To reduce contrast, selective mitigation measures #3 (minimize ground disturbance) and #9 (maximize span length) would be applied.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6N	Location Sketch 
Key Observation Point # 223 U.S. Highway 40 (viewpoint pullout east of Craig)	Range: 89W	
VRM Class/VQO: n/a	Section: 4	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat to gently rolling, geometric/blocky	Tall clumping and low, amorphous and geometric patches, stippled in	Thin vertical
Line	Flat horizontal to undulating horizontal	Horizontal, vertical, diffuse and butt edges	Vertical
Color	Browns, tans, light reds	Variations of greens, tans, yellows, reds	Subtle grays
Texture	Fine grain	Medium to coarse grain	Fine grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, thin, triangular
Line	n/a	n/a	Vertical/diagonal; thin/weak concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View west from US Highway 40, Colorado

Weak contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting associated with U.S. Highway 40 and the Yampa River valley, east of Craig, Colorado. The proposed Project would be seen from a level view in an intermittently screened condition with structures skylined as the proposed Project traverses rolling terrain. Disturbance associated with construction access and tower pads would not be visible from this KOP. The proposed structures and conductors would be visible approximately 1.5 miles away and due to the screening present from this viewpoint, these structures would weakly contrast with existing structures in this landscape.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/6/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 21N	Location Sketch 
Key Observation Point # 224 U.S. Highway 30 (Walcott)	Range: 84W	
VRM Class/VQO: III	Section: 25	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Indistinct, low, rolling	Amorphous and geometric patches, areas of stippling	Thin repeating vertical, geometric/rectangular
Line	Gently curving/straight band, horizontal, diagonal	Indistinct to weak diffuse edges and strong butt edges (at road,	Vertical, diagonal, broken horizontal
Color	Browns, tans, grays	Greens, tans, grays, yellows	Subtle grays, browns, white
Texture	Fine grain, smooth	Fine to medium grain	Medium grain, sparse to medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic and diminishing; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Browns, tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/6/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from U.S. Highway 30, Wyoming

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting with VRM Class IV designation and associated with U.S. Highway 30 northeast of Walcott Junction, Wyoming. The proposed Project would be seen from a superior view with the top portions of structures and conductors skylined as it crosses through rolling terrain. Disturbance associated with construction access and tower pads would have weak contrast in the landform and vegetation elements of form, line, color, and texture as additional diagonal lines would be produced which would be similar to existing disturbances. The proposed structures would be seen approximately 1.5 miles away and would introduce a weak/moderate contrast with existing structural elements in view.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 14N	Location Sketch 
Key Observation Point # 225 Outlaw Trail Loop Scenic Dr(WY 789 N of Baggs)	Range: 91W	
VRM Class/VQO: III	Section: 18	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, gently rolling, blocky	Large, amorphous patches	Low, cylindrical and thin, vertical
Line	Horizontal, diagonal	Butt (at road) and diffuse edges	Vertical, horizontal
Color	Greenish-gray, tan, grays (road)	Greens, yellow, tans	Dark, dull green, tans, light grays, browns
Texture	Fine grain, smooth	Fine to medium grain	Fine grain

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Rectangular tower pads and access parallel to highway	Cleared rectangular portions for tower pads and access	Bold, vertical, rhythmic and diminishing; complex
Line	Diagonal, horizontal	Creating butt edge at clearings	Vertical/diagonal, horizontal; concave (conductors)
Color	Contrasting tans from exposed soil	Low growing reestablished vegetation; greens, yellow, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south on Wyoming Highway 789

Strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting with VRM Class IV designation and associated with long duration views along Wyoming Highway 789. The proposed Project would be seen from a level view with structures and conductors skylined as it crosses through relatively flat terrain. Disturbance associated with construction access and tower pads would have weak contrast in the landform and vegetation elements of form, line, color, and texture as broken diagonal lines from the disturbance would be intermittently visible. The proposed structures and conductors would be visible directly adjacent to the road and would strongly contrast with existing structural elements of form, line, color, and texture as the structures and conductors would be visible above the horizon for a long duration as they parallel the highway. Please note the proposed Project would traverse an area of VRM Class III approximately 3 miles to the north. Views from Wyoming Highway 789, of the proposed Project traversing this area approximately 0.5 mile away from the highway, would be partially screened by terrain traveling northbound. Due to the short view duration of the potential Project traversing this area, approximately 3 miles on a high-speed travel route and the partial screening, the Project would be compliant with VRM Class III objectives.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 5/3/2013
BLM Field Office/National Forest: Rawlins Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 21N	Location Sketch 
Key Observation Point # 226 Interstate 80 (east of Sinclair)	Range: 84W	
VRM Class/VQO: III	Section: 32	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Low, pyramidal to blocky	Indistinct clumped, some stippled areas	Thin repeating vertical
Line	Irregular, angular, diagonal, layered	Indistinct, diffuse, diagonal	Vertical, horizontal, diagonal
Color	Browns, tans, grays	Dull and dark green, tans	Browns, subtle grays
Texture	Fine to medium grain	Fine to medium grain	Fine grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Bold, vertical, rhythmic; complex geometric/triangular
Line	n/a	n/a	Vertical/diagonal, horizontal; concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	5/3/2013
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from Interstate 80, Wyoming

Weak/moderate to moderate contrast would result from the construction and operation of the proposed Project in a focal landscape setting with VRM Class IV designation and associated with views from Interstate 80. The proposed Project would be located behind the adjacent ridge; therefore, the proposed Project would be mostly screened from view. Disturbance associated with construction access and tower pads as well as any right-of-way vegetation clearing would also be screened by the adjacent ridge. The proposed structures and conductors would be seen at approximately 0.75 mile and introduce moderate contrast as only the top portion of the structures would be visible, skylined over the ridge.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/30/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 20N	Location Sketch 
Key Observation Point # 227 Wyoming Highway 71	Range: 88W	
VRM Class/VQO: III	Section: 1	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Low, undulating	Amorphous patches, curving strip, mottled	n/a
Line	Undulating, horizontal	Curving and diagonal butt edges	n/a
Color	Tans, browns, grays (road)	Variations of greens, golden	n/a
Texture	Fine grain	Fine to medium grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Tans, browns	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/30/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from Wyoming Highway 71

Moderate/strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape associated with Wyoming Highway 71. Disturbance associated with construction access as well as vegetation clearing in the right-of-way would be mostly screened from view but where visible, would introduce curvilinear lines and geometric forms. The proposed structures and conductors would be viewed in a skylined condition from less than 0.5 mile away and would introduce strong contrast for structure elements of form, line, color, and texture into the landscape. Selective mitigation measure #9 (maximize span length) would be applied at the highway crossing to reduce the dominance of the transmission line structures within the view, however structure contrast would remain strong as the structures and conductors would still be seen in a skylined condition.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 19N	Location Sketch 
Key Observation Point # 228 Outlaw Trail Loop Scenic Drive(WY HWY 789 S of I-80)	Range: 92W	
VRM Class/VQO: IV	Section: 3	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Gently rolling	Low, amorphous and geometric patches	Thin vertical
Line	Undulating horizontal, continuous	Diffuse and butt edges	Vertical, weak horizontal
Color	Browns, tans, grays (road)	Greens, tans, browns	Light browns, subtle grays, green
Texture	Fine grain	Fine to medium grain	Fine grain, repeating

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, thin; geometric, triangular
Line	n/a	n/a	Vertical/diagonal; thin concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Wyoming Highway 789

Moderate/strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape with VRM Class IV designation and associated with Wyoming Highway 789. The proposed Project would be seen from a level view with structures and conductors skylined as it crosses through rolling terrain from an inferior viewing position. Earthwork associated with access road and tower pad construction as well as any right-of-way vegetation clearing would not be visible from this viewpoint because of topographic screening. The proposed structures and conductors would be seen along the horizon at 0.7 mile away and would introduce moderate/strong structure contrast. The span between structures at the crossing of the highway would be maximized (selective mitigation measure #9) to reduce their dominance on views from the highway and therefore, contrast would also be reduced.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/30/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 20N	Location Sketch 
Key Observation Point # 229 Wamsutter residential	Range: 94W	
VRM Class/VQO: III	Section: 34	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat and level to slightly rolling	Low, amorphous patches and tall pyramidal	Geometric rectangular (home), thin vertical, low vertical and horizontal
Line	Horizontal, continuous	Irregular, diffuse and indistinguishable	Vertical, horizontal, diagonal
Color	Browns, tans, grays	Greens, tans	Browns, whites, reds
Texture	Fine grain	Fine to medium grain	Medium to coarse grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Thin, vertical
Line	n/a	n/a	Thin vertical
Color	n/a	n/a	Dull gray
Texture	n/a	n/a	Uniform repeating medium grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/30/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from residence along Wamsutter-Crooks Gap Road in Wamsutter, Wyoming

Weak contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting with VRM Class III designation and associated with residences in Wamsutter, Wyoming. The proposed Project would be seen from a level view and intermittently screened in nearly flat terrain. Disturbance associated with construction access and tower pads would not be visible from this KOP. The proposed structures and conductors would be visible approximately 3 miles away and would have a weak contrast with existing structural elements as viewed from this location.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/3/2011
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 3N	Location Sketch 
Key Observation Point # 239 Dinosaur Diamond SB (Colorado St HWY 64)	Range: 103W	
VRM Class/VQO: III	Section: 19	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat/slightly concave to gently rolling, horizontal, geometric	Low indistinct amorphous and geometric patches	Vertical, rhythmic; geometric/triangular
Line	Continuous, layered horizontal, simple, curving	Indistinct, butt and diffuse edges	Vertical/diagonal, horizontal; concave (conductors)
Color	Light gray, tans, light brown	Sage, greens, tans, yellow	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Repeating medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, rhythmic; geometric/triangular
Line	n/a	n/a	Vertical/diagonal, horizontal; concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/3/2011
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Colorado State Highway 64

Weak/moderate to moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting with VRM Class III designation as viewed from Colorado State Highway 64. The proposed Project would cross through relatively flat terrain in a skylined condition. Due to topographic screening in the rolling terrain, modifications to the landform and vegetation components of contrast would not be visible from this KOP. The Project structures and conductors would be visible at approximately 0.5 miles above the horizon and introduce moderate structure contrast. The proposed Project would parallel an existing transmission line, but the existing transmission line is backdropped and intermittently screened whereas the proposed Project would be viewed in a skylined condition. Selective mitigation measure #9 (maximize span length) would be applied at the highway crossing to reduce the visual dominance of the transmission line structures being located adjacent to the highway.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 5/2/2013
BLM Field Office/National Forest: White River Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 2N	Location Sketch 
Key Observation Point # 240 Colorado State Highway 64	Range: 101W	
VRM Class/VQO: III	Section: 33	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Bold, pyramidal/blocky with Horizontal/diagonal bands	Amorphous patches, stippled areas	Rectangular, triangular
Line	Horizontal, diagonal	Diffuse and butt edges	Horizontal, diagonal
Color	Brown-tans	Greens, grays, tans yellow	Grays, white, browns
Texture	Fine to coarse grain	Fine to coarse grain	Medium grain, sparse

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Geometric clearings for tower pad and access	Cleared portions for tower pads and access creating geometric	Vertical, rhythmic; geometric/triangular
Line	Diagonal, horizontal	Horizontal and or diagonal butt edges at clearings	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Tans	Tans and greens of remaining vegetation after clearing for tower	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

No

Evaluator(s):

Nate Ferguson

VISUAL CONTRAST RATING WORKSHEET

Date:	5/2/2013
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View east from Colorado State Highway 64, east of Rangely Colorado

Moderate contrast would result from the construction and operation of the proposed Project in a panoramic landscape associated with Colorado State Highway 64 near Rangely, Colorado. The proposed Project would traverse dissected, sloping terrain in partially screened and skylined conditions. Construction access and tower pad disturbance would weakly contrast with existing landform characteristics since much of the associated disturbance would be screened from viewers along the highway. Weak contrast with existing vegetation patterns would occur where right-of-way clearing through pinyon-juniper vegetation would create geometric forms. Moderate structure contrast would be generated since the proposed Project would be viewed intermittently above the horizon.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/3/2011
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 1N	Location Sketch 
Key Observation Point # 241 Dinosaur Diamond SB in Canyon Pintado NHD	Range: 101W	
VRM Class/VQO: III	Section: 18	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rugged, dissected, ridges and narrow valleys/drainages	Patches and stippled areas	Thin vertical, rectangular
Line	Complex, diagonal	Butt and diffuse edges	Vertical
Color	Tans, grays	Light and dark greens, tans	Browns, grays
Texture	Medium to coarse grain	Medium to coarse grain	Fine grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Geometric tower pads and access	Cleared portions for tower pads and access	Bold, vertical; complex geometric/triangular
Line	Diagonal, horizontal	Creating butt edge at clearing	Vertical/diagonal, horizontal; concave (conductors)
Color	Contrasting tans from soil disturbance for clearings	Light and dark greens, tans	Dull gray, transparent
Texture	Medium grain	Medium to coarse grain	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/3/2011
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from Colorado State Route 139, Dinosaur Diamond Scenic Byway

Strong contrast would result from the construction and operation of the proposed Project in an enclosed landscape setting with VRM Class III designation as viewed from the Dinosaur Diamond Scenic Byway near Rangely, Colorado. The proposed Project would cross rugged terrain in a skylined condition. Modifications to landform associated with construction access and tower pad earthwork would introduce moderate contrast to landform elements of form, line, color, and texture as thin contrasting diagonal lines would be introduced. Similarly, moderate contrast of vegetation elements of form, line, color, and texture would occur where geometric clearings produced by right-of-way clearing through pinyon-juniper would be visible. The proposed structures and conductors would be visible from 0.5 mile in a skylined condition which would introduce strong structure contrast. To reduce contrast, selective mitigation measures #3 (minimize earthwork), #4 (minimize vegetation clearing), and #9 (maximize span length) would be applied to decrease contrast to the extent practicable. To further reduce contrast, the proposed Project could be located closer to the existing 138kV transmission line which would mostly screen views of the proposed Project from this location.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 4S	Location Sketch 
Key Observation Point # 242 Whiskey Creek residential	Range: 104W	
VRM Class/VQO: III	Section: 24	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rugged, blocky, dissected, ridges and narrow valleys/drainages	Patches/clumped and stippled areas	n/a
Line	Complex, diagonal, horizontal	Diffuse edges	n/a
Color	Tans, grays, reds	Light and dark greens, tans, yellow	n/a
Texture	Medium to coarse grain	Coarse grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Geometric clearings for tower pads and access	Low geometric patches of reestablished vegetation	Bold, vertical; complex geometric/triangular
Line	Horizontal, diagonal	Horizontal and diagonal butt and diffuse edges created at clearings	Vertical/diagonal; thin concave (conductors)
Color	Tans, reds	Tans, green	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View west from Whiskey Creek Road, Colorado

Moderate to moderate/strong contrast would result from the construction and operation of the proposed Project within a partially enclosed landscape designated as VRM Class III and viewed from a residence in Whiskey Canyon. The proposed Project crosses moderately steep terrain and would be skylined as it crosses along the top of the ridge. Disturbance associated with construction access would introduce curvilinear lines and geometric forms that would be incongruent with existing landscape patterns. Due to the scattered vegetation within the right-of-way, contrast produced by vegetation clearing in the right-of-way would be weak. The proposed structures would be seen 0.3 mile away from an inferior viewing position. To reduce contrast, selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would be applied.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	Grand Junction Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 5S	Location Sketch 
Key Observation Point # 243 Baxter Pass Road	Range: 103W	
VRM Class/VQO: IV	Section: 34	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rugged, dissected, ridges and narrow valleys/drainages	Patches and stippled areas	n/a
Line	Complex, diagonal	Butt and diffuse edges	n/a
Color	Tans, grays	Light and dark greens, tans	n/a
Texture	Medium to coarse grain	Medium to coarse grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, rhythmic and diminishing; geometric/triangular
Line	Curvilinear, geometric	Diagonal, butt edge	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Tans, grays	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	Grand Junction Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



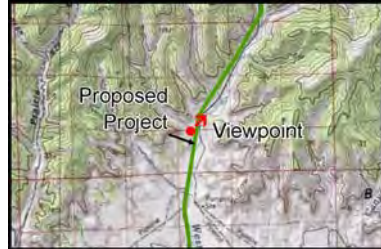
View southeast from Baxter Pass, Colorado

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated by the BLM as VRM Class IV viewed from Baxter Pass. The proposed Project traverses moderately steep to level terrain as it follows the drainage located below the viewpoint. Due to the superior viewer position, disturbance associated with construction road access would be visible and introduce curvilinear lines and geometric forms into the landscape. Vegetation clearing within the right-of-way would also introduce geometric forms, which would be incongruent with existing vegetation patterns. The proposed structures would be seen 1.2 miles away backdropped by the adjacent steep terrain.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	Grand Junction Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 7S	Location Sketch 
Key Observation Point # 244 Garfield County Road 201 (south of Baxter Pass)	Range: 104W	
VRM Class/VQO: III	Section: 34	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rugged, dissected, ridges and narrow valleys/drainages	Patches and stippled areas	n/a
Line	Complex, diagonal	Butt and diffuse edges	n/a
Color	Tans, grays	Light and dark greens, tans	n/a
Texture	Medium to coarse grain	Medium to coarse grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads), stippled vegetation	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Indistinct, regular, diffuse edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Light tans, browns, reds	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	Grand Junction Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from Garfield County Road 201, Colorado

Moderate/strong to strong contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting with a VRM Class III designation along Garfield County Road 201. The proposed Project would cross steep terrain and would require construction access roads to be built on the sides of the canyon producing large areas of earthwork. Vegetation clearing in the right-of-way would mostly be screened by adjacent vegetation but where visible, would introduce geometric forms into the landscape. The proposed structures would be located directly adjacent to the road and due to this proximity, structures may be skylined. Through the application of selective mitigation measure #7, which would relocate the project into the valley floor, contrast generated by constructing access roads on steep terrain would be reduced. To further reduce contrast on views from this road, selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would be applied.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 18S	Location Sketch 
Key Observation Point # 245 Old U.S. Highway 6 (west of Mack)	Range: 26E	
VRM Class/VQO: III	Section: 29	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Shallow slopes, rugged in areas	Indistinct, stippled, band along riparian corridor, geometric clearing	n/a
Line	Horizontal, broken diagonal	Indistinct, diffuse edges, butt edge adjacent to road	n/a
Color	Tans	gray-greens, tans	n/a
Texture	Fine to medium grain	Medium grain, uneven/random	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular in riparian corridor	Vertical, rhythmic and diminishing; geometric/triangular
Line	Geometric, curvilinear	Angular, butt edge through riparian corridor	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Repeating/diminishing coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View west on Old U.S. Highway 6, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting with VRM Class III designation and associated with long duration views from Old US Highway 6. The project would be viewed in a backdropped condition from a level to superior position as it traverses through gently sloped terrain. Disturbance associated with construction access and tower pads would have weak contrast with landform and vegetation due to the rolling terrain and low-growing vegetation. The proposed structures and conductors would be visible at approximately 0.5 mile and would produce a moderate/strong contrast with structural elements in this natural landscape setting.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 20S	Location Sketch 
Key Observation Point # 246 Interstate 70 (east of Thompson Springs)	Range: 24E	
VRM Class/VQO: III	Section: 21	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, smooth, level	Short, patchy	Vertical, thin
Line	Horizontal, continuous	Angular, broken, diffuse edges	Vertical, concave
Color	Tans, grays	Gray-greens, tans, browns, dull	Brown
Texture	Fine grain	Even, fine grain	Coarse grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical, rhythmic and diminishing; complex
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from Interstate 70, Utah

Strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting with VRM Class III designation and associated with viewers traveling along I-70. Motorists would have long duration views of the proposed Project as it parallels the interstate through flat terrain in a skylined condition. Disturbance associated with construction access and tower pads would weakly contrast with existing landform and vegetation elements of form, line, color, and texture due to the flat terrain and low-growing vegetation. The proposed structures and conductors would be visible at approximately a 0.5 mile and would have strong contrast with structure elements of form, line, color, and texture.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 7N	Location Sketch 
Key Observation Point # 251 U.S. Highway 40 (east of Craig)	Range: 89W	
VRM Class/VQO: n/a	Section: 32	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Blocky to flat	Sparse and stippled to large clumps and low geometric patches	Low geometric/rectangular
Line	Curving, continuous, diagonal, horizontal	Diffuse to straight and curving butt edge	Weak horizontal and vertical
Color	Tans, beige, grays (railroad and road)	Variations of green, yellow, tan, reds	Grays, tan
Texture	Fine to medium grain	Fine to coarse, dense	Fine grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Geometric clearing for tower pad	Geometric patch at clearing of reestablished low vegetation	Bold, vertical; complex geometric/triangular
Line	Horizontal	Horizontal	Vertical/diagonal; thin concave (conductors)
Color	Tan	Green, tan	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View west from U.S. Highway 40, Colorado

Moderate/strong contrast would result from the construction and operation of the proposed Project in a panoramic/feature landscape setting associated with U.S. Highway 40 and the Yampa River Valley, east of Craig, Colorado. The proposed Project would be seen from an inferior position with the structures and conductors skylined as the proposed Project crosses over a ridge and continues down into the valley. Disturbance associated with construction access and tower pads would have weak/moderate contrast with existing landform characteristics. Contrast with existing vegetation elements of form, line, color, and texture would be weak. The proposed structures and conductors would be visible at approximately a 0.5 mile and would have strong contrast with structure elements of form, line, color, and texture as structures and conductors would be seen in a prominent, skylined position. To reduce contrast, selective mitigation measure #3 (minimize ground disturbance) would be applied to limit earthwork efforts on the ridge to the extent practicable.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	5/2/2013
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 7N Range: 97W Section: 4	Location Sketch 
Key Observation Point # 252 Colorado State Highway 318 (west of Maybell)		
VRM Class/VQO: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rounded, moderate to steep slopes	Amorphous patches and stippled areas	n/a
Line	Undulating horizontal	Indistinct to weak diffuse edges	n/a
Color	Tans, beige	Dark to light greens, tans	n/a
Texture	Fine to medium grain	Medium to coarse	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Geometric clearings for tower pad and access	Cleared portions for tower pads and access creating geometric	Vertical; complex geometric/triangular
Line	Diagonal, horizontal	Horizontal and or diagonal butt edges at clearings	Vertical/diagonal; thin concave (conductors)
Color	Tans	Tans and greens of remaining vegetation after clearing for tower	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	5/2/2013
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View west from Colorado State Highway 318

Moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape associated with Colorado State Highway 318. The proposed Project would cross rolling terrain in partially screened and backdropped conditions from a slightly superior view. Construction access and tower pad earthwork would introduce weak contrast to landform and vegetation. The proposed structures and conductors would cross the road perpendicular approximately 0.5 mile and would introduce moderate structure contrast into the landscape for structure elements of form, line, color and texture into this natural landscape setting.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/3/2011
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 3N	Location Sketch 
Key Observation Point # 254 U.S. Highway 40 (east of Dinosaur)	Range: 100W	
VRM Class/VQO: III	Section: 2	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rolling, low relief, concave	Amorphous patches, stippled in areas, complex	Vertical, rhythmic; complex geometric/triangular
Line	Undulating and layered horizontal, curving, straight	Irregular, diffuse and butt edges	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, grays, red-brown	Greens, yellow, tan, sage	Dull gray, transparent
Texture	Fine to medium grain	Fine to medium grain	Repeating medium grain and density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Thin continuous diagonal and geometric clearings for tower pads	Thin continuous strip of low reestablished vegetation at clearing	Bold, vertical, rhythmic; complex geometric/triangular
Line	Diagonal	Diagonal butt edge created at clearing	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Tans, greens	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/3/2011
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from U.S. Highway 40, Colorado

Weak/moderate to moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting with VRM Class III designation and associated with U.S. Highway 40 east of Massadona, Colorado. The proposed Project would be seen from a level view with the top portions of structures and conductors skylined as it crosses through rolling terrain. Disturbance associated with construction access and tower pads would have weak contrast in the landform and vegetation elements of form, line, color, and texture as broken diagonal lines from the disturbance would be visible through the rolling terrain. The proposed structures and conductors would be visible at 0.3 mile, which would have a moderate/strong contrast with existing structural elements visible in this landscape including two existing transmission lines. The existing transmission lines are located approximately 1,500 feet further away from this viewpoint than the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/12/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 20S	Location Sketch 
Key Observation Point # 255 Mexican Mountain WSA	Range: 13E	
VRM Class/VQO: III	Section: 25	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rugged, complex, rolling	Indistinct, patches, stippled	Vertical, geometric
Line	Horizontal, diagonal, angular, undulating	Indistinct	Vertical/diagonal, horizontal; concave (conductors)
Color	Reds, browns, tans, whites	Dark greens, tans	Browns
Texture	Fine to medium grain, striated	Medium grain, uneven random	Repeating medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, reds, lighter colored soils	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/12/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



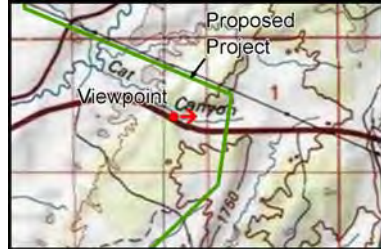
View northwest from boundary of Mexican Mountain Wilderness Study Area, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated by the BLM as VRM Class III viewed from the Mexican Mountain Wilderness Study Area. The proposed Project traverses rolling terrain and would be backdropped by the adjacent landforms. Disturbance associated with construction access would be partially screened by terrain but where visible, would introduce a weak/moderate contrast with existing landforms due to the curvilinear forms generated by road construction. Due to the sparse, low-growing vegetation present in this landscape, there would be a weak contrast with existing vegetation patterns. The proposed structures would be seen at approximately 0.5 mile viewed beyond an existing transmission line and would introduce weak/moderate structure contrast. To reduce contrast, selective mitigation measure #3 (minimize ground disturbance) would be applied to limit the visual influence of construction access roads.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/23/2012
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 15S	Location Sketch 
Key Observation Point # 256 Dinosaur Diamond SB (US 6 E of Wellington)	Range: 11E	
VRM Class/VQO: III	Section: 2	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Terraced, rolling, level	Amorphous patches and stippled areas	Moderately tall, vertical, geometric, screened
Line	Bold, horizontal, diagonal	Diffuse edges	Angular, concave, horizontal
Color	Light tans, browns	Variety of greens, tans	Brown
Texture	Fine to medium grain	Fine to medium grain	Fine grain, sparse density, matted, uniform, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic and diminishing; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Light tans, browns	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/23/2012
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



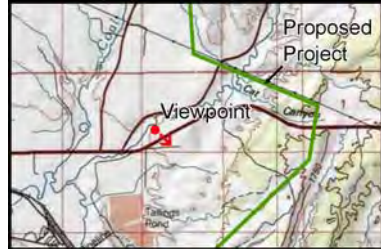
View east from Dinosaur Diamond Scenic Byway (U.S. Highway 6), Utah

Moderate contrast would result from the construction and operation of the proposed Project, within an enclosed landscape setting designated as VRM Class III and viewed from U.S. Highway 6. Disturbance associated with construction access would introduce a weak/moderate landscape contrast as roads would likely be constructed down the slope of the plateau. Weak contrast with existing vegetative patterns is anticipated after right-of-way vegetation clearing due to the low-growing, scattered vegetation which would be minimally modified. The proposed structures would be visible at approximately 0.5 mile and would introduce strong contrast as views of the existing 138kV are mostly screened by topography. Selective mitigation measure #9 (maximize span length) would reduce contrast in this area by limiting the number of proposed structures visible from this viewpoint and bring the proposed Project into compliance with VRM Class III.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/5/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 15S	Location Sketch 
Key Observation Point # 257 Dispersed residences east of Wellington	Range: 11E	
VRM Class/VQO: III	Section: 3	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	FG: Flat, horizontal MG: Simple, rolling, level	FG: Low amorphous to geometric patches	Low, geometric
Line	FG: Weak, horizontal MG: Simple, bold, horizontal,	FG: Regular, horizontal, straight MG: Diffuse edges	Horizontal and vertical
Color	FG: Browns (not visible) MG: Light tans, browns	FG: Greens to tans (seasonal) MG: Greens, tans	Tan
Texture	FG: Fine grain, matte MG: Fine to medium grain	FG: Fine to medium grain MG: Medium grain	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, rhythmic and diminishing; geometric/triangular
Line	n/a	n/a	Vertical/diagonal, horizontal; weak concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Repeating/diminishing medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/5/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



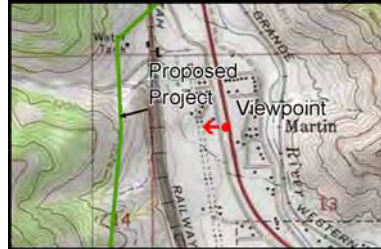
View southeast from residences east of Wellington along U.S. Highway 6, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III and viewed from residences along U.S. Highway 6. The proposed Project crosses rolling terrain and the structures would be skylined along the distant ridge. Disturbance associated with construction access and right-of-way clearing would be screened by topography, therefore these disturbances would not be visible from the KOP. The proposed structures would be seen approximately 1.5 miles away partially skylined.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/3/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 258 Martin residential	Range: 9E	
VRM Class/VQO: III	Section: 13	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Undulating, horizontal, bold vertical, rugged	Few, stippled, amorphous patches	Vertical, geometric
Line	Curving, vertical, diagonal, angular	Weak diffuse, indistinct, broken	Vertical, concave, horizontal
Color	Tans, browns, grays	Dark greens, tans, gray-greens	Brown, gray
Texture	Banded, coarse grain	Fine to medium grain, uneven/random	Medium grain, dense

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Stippled vegetation	Bold, vertical; complex geometric/triangular
Line	Geometric, curvilinear	Diffuse edge	Vertical/diagonal; thin concave (conductors)
Color	Tans, browns, grays	Tans, gray-greens	Dull gray, transparent
Texture	Fine textured	Fine to medium grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/3/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



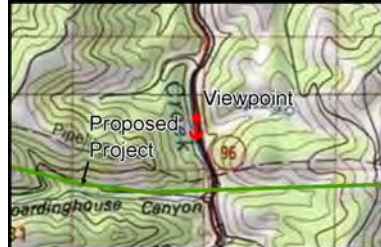
View west from residences in Martin, Utah

Moderate contrast would result from the construction and operation of the proposed Project in an enclosed landscape setting as viewed from residences in Martin, Utah toward land designated as VRM Class III. The proposed Project would cross moderately steep terrain and would be backdropped by adjacent terrain as viewed from an inferior position. Disturbance associated with the construction of access roads as well as clearing of vegetation within the right-of-way would introduce additional geometric forms into the landscape. The proposed structures would be seen at approximately 0.25 mile in context with an existing 138kV transmission line. The proposed structures would introduce moderate structure contrast and these structures would begin to dominate the landscape character due to the relative scale of the proposed Project. To reduce contrast associated with the construction of access roads and tower pads, selective mitigation measure #3 (minimize ground disturbance) would be applied.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/27/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 259 Energy Loop Scenic Byway (Utah State Route 96)	Range: 7E	
VRM Class/VQO: n/a	Section: 29	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Diagonal, bold, rounded	Vertical, complex, pyramidal, amorphous	Vertical, thin
Line	Curving, angular, continuous	Flowing, complex, irregular, butt edge	Vertical, angular
Color	Tans	Vivid, greens, tans, seasonal variation	Browns
Texture	Medium to coarse grain	Coarse, stippled, scattered	Fine grain

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, thin; geometric, triangular
Line	n/a	n/a	Vertical/diagonal; thin concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Energy Loop Scenic Byway (Utah State Route 96), Utah

Moderate contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting as viewed from the Energy Loop Scenic Byway. The proposed Project would cross steep terrain and would be partially backdropped by adjacent terrain. Construction access roads and right-of-way vegetation clearing would be screened by existing vegetation and topography from this KOP. The proposed structures would be located approximately 0.5 mile away with most of the structures screened by topography and vegetation, but where visible, these structures would introduce a moderate/strong structure contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 9/27/2011
BLM Field Office/National Forest: Manti-La Sal National Forest
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 260 Energy Loop Scenic Byway (Utah State Route 31)	Range: 5E	
VRM Class/VQO: Partial Retention	Section: 27	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Diagonal, bold, rounded	Vertical, complex, pyramidal, amorphous	n/a
Line	Curving, continuous	Flowing, complex, irregular	n/a
Color	Tans	Vivid, variety of greens, white, tans, seasonal variation	n/a
Texture	Medium to coarse grain	Dense, stippled	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Bold, vertical, rhythmic; complex geometric/triangular
Line	Curvilinear, geometric	Angular, bold, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from Energy Loop Scenic Byway (Utah State Route 31), Utah

Strong contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting designated by the Manti-La Sal National Forest as a partial retention VQO. The proposed Project would cross steep terrain and would be partially backdropped by the canyon walls. Construction access along the steep canyon slopes would generate a moderate/strong contrast with the existing landforms. The geometric form created by right-of-way vegetation clearing would produce a moderate/strong contrast with existing vegetation patterns. The proposed structures would be seen at approximately 0.3 mile away and introduce a strong structure contrast into the landscape. Selective mitigation measures #3 (minimize ground disturbance), #4 (minimize vegetation clearing), and #9 (maximize span length) would be applied to reduce contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/26/2011
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 14S	Location Sketch 
Key Observation Point # 261 Fairview residential	Range: 4E	
VRM Class/VQO: n/a	Section: 2	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Level, undulating, rolling	Vertical, amorphous patches, stippled areas	Low, geometric
Line	Diagonal, curving	Flowing, complex, diffuse and butt edges	Diagonal, horizontal
Color	Tans, whites	Greens, tans, seasonal variation	Browns, grays
Texture	Medium to fine grain	Medium grain	Medium grain, dense

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Thin, vertical
Line	Geometric, curvilinear	Angular, butt edge	Thin, vertical; thin/weak concave (conductors)
Color	Tans, whites	Tans, gray-green	Dull gray
Texture	Fine grain	Fine to medium grain	Uniform repeating medium grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/26/2011
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from 100 East adjacent to residences in Fairview, Utah

Moderate contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting as viewed from Fairview, Utah. The proposed Project crosses steep terrain and would be backdropped by adjacent terrain. Disturbance associated with construction access and vegetation clearing in the right-of-way would be visible across the side of the mountain. These disturbances would introduce moderate to moderate/strong landscape contrast as a result of the geometric forms created by these activities. The proposed structures would be viewed from an inferior viewing position approximately 2 miles away which would introduce a weak/moderate structure contrast because of the distance between the proposed Project and this viewpoint. Selective mitigation measures #3 (minimize ground disturbance) and 4 (minimize vegetation clearing) would reduce landscape contrast generated by the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/26/2011
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 15S	Location Sketch 
Key Observation Point # 262 Dispersed residences east of Mount Pleasant	Range: 4E	
VRM Class/VQO: n/a	Section: 1	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	FG: Flat/slightly concave to gently rolling	FG: Low indistinct patches, stippled areas	Vertical, geometric
Line	FG: Continuous, horizontal, simple BG: Diagonal, undulating	FG: Indistinct, weak diffuse edges BG: Butt edges, complex	Vertical/diagonal, horizontal; concave (conductors)
Color	FG: Tans (not visible) BG: Tans (not visible) and grays	FG: Sage greens, tans BG: Light and dark greens, seasonal	Brown
Texture	FG: Fine grain BG: Moderate to coarse grain	FG: Fine to medium grain BG: Moderate to coarse grain	Fine grain, medium density, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Bold, vertical, rhythmic; complex geometric/triangular
Line	Geometric, curvilinear	Angular, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

**Does project design meet visual
resource management objectives?**

n/a

**Additional mitigating measures
recommended?**

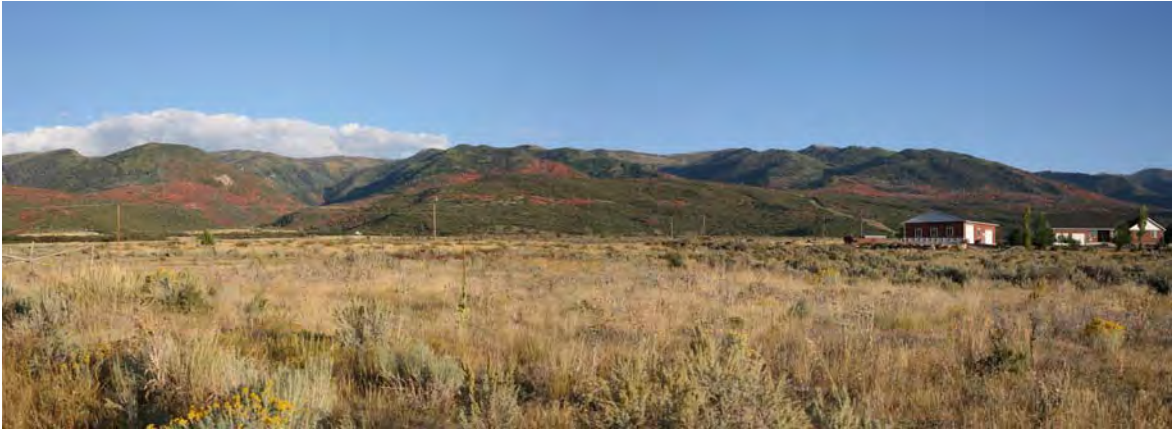
Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/26/2011
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southeast from residence east of Mount Pleasant, Utah

Moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting as viewed from residences east of Mount Pleasant. The proposed Project crosses flat to moderately steep terrain and would be backdropped by adjacent terrain. Disturbances associated with construction access roads and tower pads would introduce geometric forms incongruent with the existing landscape character. Right-of-way vegetation clearing would create a bold, geometric form that would be similar to the cleared right-of-way for the existing 345kV transmission line. The proposed structures would be seen on the Wasatch Plateau 1.7 miles away but would be seen at approximately 0.25 mile in the adjacent valley landscape from a level to an inferior viewing position in context with an existing 345kV transmission line. Selective mitigation measures #3 (minimize cut and fill) and #4 (minimize tree clearing) would reduce contrast produced by the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/26/2011
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 14S	Location Sketch 
Key Observation Point # 263 Mount Pleasant residential	Range: 4E	
VRM Class/VQO: n/a	Section: 34	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Level to slightly rolling, prominent Wasatch Plateau in the background	Low grassland, moderately tall trees	Rectangular, geometric
Line	Horizontal	Vertical, smooth	Angular, horizontal
Color	Tans	Greens, tans	Gray, white, red, brown
Texture	Smooth	Fine to medium grain	Medium to coarse grain, dense

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, rhythmic; geometric/triangular
Line	n/a	n/a	Vertical/diagonal, horizontal; weak concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Repeating medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/26/2011
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from residences along 500 North in Mount Pleasant, Utah

Weak contrast would result from the construction and operation of the proposed Project in a partially enclosed landscape setting from residences within Mount Pleasant, Utah. The proposed Project would cross relatively flat to slightly rolling terrain and where visible, would be backdropped by adjacent terrain. Disturbances associated with construction of access roads and clearing of vegetation within the right-of-way would not be visible from this KOP due to topographic and structural screening. The proposed structures would be located 1.2 miles away from this viewpoint and would be mostly screened from view. Where visible, the proposed structures would introduce a weak/moderate structure contrast into the landscape.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 5/12/2009
BLM Field Office/National Forest: Richfield Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 14S	Location Sketch 
Key Observation Point # 264 Big Hollow WMA Destination Route	Range: 3E	
VRM Class/VQO: III	Section: 5	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Domed, pyramidal, rolling	Dense vegetation transitioning to stippled areas along ridges	Vertical, rhythmic; geometric
Line	Diagonal, horizontal, curvilinear	Diagonal, butt to diffuse edges	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, light browns	Light and dark greens	Reflective, gray, dark brown
Texture	Fine to medium in exposed rocks	Fine to medium grain	Medium grain, medium density, matted, uniform, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, rhythmic; geometric/triangular
Line	Curvilinear, geometric	Diagonal, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, light browns	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	5/12/2009
BLM Field Office/National Forest:	Richfield Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View east from Big Hollow Road, Utah

Moderate contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting designated as VRM Class III as viewed from Big Hollow Road. The proposed Project would cross moderately steep terrain and would include right-of-way clearing through pinyon-juniper vegetation which would introduce additional geometric forms similar to the existing transmission line corridor. Construction access would produce curvilinear lines consistent with the existing transmission line access roads. The proposed structures would be seen at approximately 0.75 mile and would produce a weak/moderate structure contrast due to the adjacent existing 345kV and 138kV transmission lines.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/26/2011
BLM Field Office/National Forest:	Fillmore Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 12S	Location Sketch 
Key Observation Point # 265 Interstate 15 (Nephi)	Range: 1E	
VRM Class/VQO: n/a	Section: 28	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Angular, undulating, steep	Amorphous patches, stippled areas	Tall, vertical, geometric, transparent
Line	Diagonal, hard, rolling	Flowing, diffuse and butt edges	Vertical, complex
Color	Grays, tans	Dark greens, tans, gray-green	Dull gray
Texture	Fine to medium grain	Medium grain	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Bold, vertical, rhythmic and diminishing; complex
Line	Curvilinear, geometric	Bold, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/26/2011
BLM Field Office/National Forest:	Fillmore Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southeast from Interstate 15 adjacent to Nephi, Utah

Moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting as viewed from Interstate 15. The proposed Project crosses moderately steep terrain and would be skylined as it crosses the foothills. Disturbance associated with construction access would generate a weak/moderate contrast with existing landforms through the addition of geometric and curvilinear lines. The geometric form created by right-of-way vegetation clearing would produce a moderate level of landscape contrast. The proposed structures would be seen 0.3 mile away in an area with several existing transmission lines. Due to the proximity of the proposed Project to this viewpoint and the existing transmission lines, a moderate level of structure contrast was assessed. Selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would reduce landscape contrast produced by the proposed Project on the steep, pinyon-juniper foothills.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/26/2012
BLM Field Office/National Forest:	Salt Lake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 9S	Location Sketch 
Key Observation Point # 266 U.S. Highway 6 (Spanish Fork Canyon)	Range: 4E	
VRM Class/VQO: n/a	Section: 27	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Bold, prominent, rugged	Amorphous patches, stippled areas	Vertical, thin, triangular
Line	Diagonal, undulating, bold	Complex, butt and diffuse edges	Vertical/diagonal; thin/weak concave (conductors)
Color	Tans, grays	Greens, tans, seasonal variation	Grays, browns
Texture	Medium to coarse grain	Medium to coarse grain	Medium grain, medium to sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, thin, triangular
Line	Curvilinear, geometric	Angular, butt edge	Vertical/diagonal; thin/weak concave (conductors)
Color	Tans, grays	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

**Does project design meet visual
resource management objectives?**

n/a

**Additional mitigating measures
recommended?**

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/26/2012
BLM Field Office/National Forest:	Salt Lake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southeast on U.S. Highway 6 in Spanish Fork Canyon, Utah

Weak/moderate to moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting as viewed from U.S. Highway 6. The proposed Project crosses steep terrain and would be skylined along the top of the ridge adjacent to an existing 345kV transmission line. Disturbance associated with the construction of an access road would introduce additional curvilinear lines into the existing landscape. Vegetation clearing in the right-of-way would produce additional geometric vegetation forms with angular, butt edges. The proposed structures would be seen at approximately 1.5 miles in context with an existing transmission line. Selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would reduce landscape contrast produced by the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/30/2011
BLM Field Office/National Forest:	Uinta National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 4S	Location Sketch 
Key Observation Point # 267 Battle Flats Recreation Area (Strawberry Reservoir)	Range: 10W	
VRM Class/VQO: n/a	Section: 8	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rounded, moderate slope	Diverse, numerous amorphous patches	Thin, vertical
Line	Curving, undulating, angular	Butt and diffuse edges	Thin, vertical; thin/weak concave (conductors)
Color	Tans, blues, reflective	Dark greens, sage greens, tans, seasonal variety	Dull gray
Texture	Medium grain	Medium to coarse grain	Uniform repeating medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Thin, vertical
Line	Curvilinear, geometric	Bold, butt edge	Thin, vertical; thin/weak concave (conductors)
Color	Tans	Tans, gray-green	Dull gray
Texture	Fine grain	Fine grain	Uniform repeating medium grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/30/2011
BLM Field Office/National Forest:	Uinta National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View southeast from Battle Flats Recreation Area, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting as viewed from the Battle Flats Recreation Area. The proposed Project crosses steep terrain and would be mostly backdropped by adjacent terrain. Disturbance associated with construction access would introduce additional curvilinear lines and geometric forms into the landscape. Vegetation clearing within the right-of-way would produce a geometric shape and a butt edge with existing vegetation outside of the right-of-way. The proposed structures would be seen approximately 2 miles away with intermittent views of the adjacent existing 345kV transmission line.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 9/30/2011
BLM Field Office/National Forest: Vernal Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 3S	Location Sketch 
Key Observation Point # 268 U.S. Highway 40 Pullout (west of Fruitland)	Range: 9W	
VRM Class/VQO: n/a	Section: 22	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rounded, moderate slope	Diverse, numerous amorphous patches	Vertical, rhythmic; complex geometric/triangular
Line	Curving, undulating, angular	Butt and diffuse edges	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, reds	Dark greens, sage greens, tans, seasonal variety	Dull gray, transparent
Texture	Medium grain	Medium to coarse grain	Repeating coarse to medium grain and density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Geometric tower pads and access through moderately steep slope	Geometric clearings with reestablished low vegetation	Bold, vertical, rhythmic; complex geometric/triangular
Line	Thin diagonal, horizontal	Diagonal and horizontal butt edges created at clearing	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/30/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from overlook along U.S. Highway 40 in Fruitland, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a partially enclosed landscape setting as viewed from the U.S. Highway 40 pullout west of Fruitland. The proposed Project crosses steep terrain and would be mostly backdropped by adjacent terrain, except for the towers located on the ridgeline. Disturbance associated with construction access would introduce curvilinear lines and geometric forms consistent with access roads for the adjacent 345kV transmission line. Vegetation clearing in the right-of-way would produce a geometric form with butt edges which would contrast with existing vegetation patterns. The proposed structures would be seen at approximately 0.5 mile from an inferior viewing position in context with an existing 345kV transmission line with similar form, line, color, and texture components.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 9/30/2011
BLM Field Office/National Forest: Vernal Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 3S	Location Sketch 
Key Observation Point # 269 Fruitland residential	Range: 9W	
VRM Class/VQO: n/a	Section: 23	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Horizontal, level to rolling	Low indistinct patches, stippled areas	Vertical, rhythmic and diminishing; geometric
Line	Weak, horizontal, undulating, continuous	Indistinct, weak diffuse edges	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns, tans	Tans, browns, greens	Dull gray, transparent
Texture	Fine to medium grain	Fine to medium grain	Repeating/diminishing coarse to medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic and diminishing; geometric/triangular
Line	Geometric, curvilinear	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns, tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/30/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View east from residences in Fruitland, Utah

Weak contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting as viewed from residences in Fruitland. The proposed Project would traverse mostly level terrain and be viewed from a superior viewing position. As a result of this viewing position, ground disturbance associated with the construction of access roads and tower pads would be more apparent but would be consistent with existing landforms modifications; therefore, contrast with landforms was evaluated to be weak. Due to the low-growing vegetation located in the proposed right-of-way, vegetation clearing would be minimal and when revegetated, a weak contrast with existing vegetative patterns would occur. The proposed structures would be seen at approximately 0.5 mile behind an existing 345kV transmission line with similar design characteristics. Due to the dominance of the existing transmission line, structure contrast was assessed to be at a low level.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 3S	Location Sketch 
Key Observation Point # 270 Starvation Reservoir	Range: 5W	
VRM Class/VQO: n/a	Section: 28	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Horizontal, angular	Amorphous patches, stippled areas	Vertical, geometric, cylindrical
Line	Horizontal, diagonal, parallel	Diffuse to bold edges from juniper stands	Vertical
Color	Tans, reds, blues	Light tan (grasses), dark green (juniper)	Reflective, gray, tans
Texture	Fine to medium texture	Medium grain, uneven/random	Uniform repeating medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Thin, vertical
Line	Curvilinear, geometric	Indistinct, broken, regular	Thin, vertical; thin/weak concave (conductors)
Color	Tans, reds	Sage greens, tans	Dull gray
Texture	Fine grain	Fine grain	Uniform repeating medium grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from Mountain View Campground in Starvation State Park, Utah

Weak contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting as viewed from the Starvation State Park. The proposed Project crosses flat to gently rolling terrain and would be backdropped by adjacent terrain. Disturbance associated with the construction of access roads as well as vegetation clearing in the right-of-way would be mostly screened. In locations where these project features would be visible, they would introduce weak horizontal lines and geometric forms. The proposed structures would be seen at approximately 2.5 miles from a level to slightly inferior viewing position in context with an existing 345kV transmission line, therefore, structure was assessed at a weak level.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/28/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 4S	Location Sketch 
Key Observation Point # 271 Bridgeland residential	Range: 3W	
VRM Class/VQO: n/a	Section: 4	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, indistinct	Amorphous, irregular	Vertical, geometric
Line	Horizontal, curving	Butt edge between riparian vegetation and agricultural fields	Vertical/diagonal; thin concave (conductors)
Color	Tans, grays	Variety of greens (deep greens, sage greens, medium greens) and	Gray, brown
Texture	Fine grain	Fine to medium grain	Coarse grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Tans, grays	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/28/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southeast from East River Road adjacent to residences in Bridgeland, UT

Moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting. The proposed Project crosses flat terrain and would be partially screened by vegetation. Views of disturbance associated with construction access and right-of-way vegetation clearing would be mostly screened but where visible, would introduce curvilinear lines and geometric forms into the landscape. The proposed structures would be seen at approximately 0.25 mile and in context with an existing 138kV transmission line.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/28/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 10S	Location Sketch 
Key Observation Point # 272 Sand Wash North Destination Route	Range: 17E	
VRM Class/VQO: IV	Section: 29	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat/rolling, simple	Low, amorphous patches and stippled areas	n/a
Line	Horizontal, undulating	Diffuse and butt edges between shrubland and grasslands	n/a
Color	Monotone, beige, tans	Subtle, greens/yellows	n/a
Texture	Fine to medium grain	Fine grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical, rhythmic; complex geometric/triangular
Line	Geometric, curvilinear	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Beige, tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/28/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from Sand Wash Road, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting with VRM Class IV land and associated with Sand Wash Road which provides access to North Desolation Canyon. The proposed Project would be viewed from a level position as it crosses rolling terrain in a skylined condition. Disturbance to existing landform and vegetation characteristics, associated with construction of access roads and tower pads, would not be visible from this viewpoint. The proposed structures and conductors would be seen at approximately 0.5 mile and would strongly contrast with existing structural elements of form, line, color, and texture.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/28/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 11S	Location Sketch 
Key Observation Point # 273 Nine Mile Canyon Scenic Backway	Range: 15E	
VRM Class/VQO: III	Section: 9	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Horizontal, rounded	Stippled, regular	n/a
Line	Continuous, horizontal, angular	Diffuse edges, continuous	n/a
Color	Tans	Light tan (grasses), dark green (juniper)	n/a
Texture	Fine to medium grain	Medium grain, dense	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Bold, vertical; complex geometric/triangular
Line	Geometric, curvilinear	Angular, butt edge	Vertical/diagonal; thin concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/28/2011
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from Nine Mile Canyon Scenic Backway, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting as viewed from the Nine Mile Canyon Scenic Backway through lands designated as VRM Class III. The proposed Project would cross rolling terrain and would be skylined from an inferior viewing position. Disturbance associated with the construction access roads and right-of-way vegetation clearing would be mostly screened by topography. The proposed structures would be seen at 0.5 mile and would introduce a strong structure contrast in the landscape. To reduce contrast on views along this scenic road, selective mitigation measure #9 (maximize span length) would be applied to limit dominance of transmission structures being located adjacent to the road.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/28/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 12S	Location Sketch 
Key Observation Point # 274 Indian Canyon Scenic Byway (U.S. Highway 191)	Range: 10E	
VRM Class/VQO: n/a	Section: 21	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Vertical, prominent, v-shaped	Amorphous patches, pyramidal	Vertical, geometric
Line	Bold, diagonal, rugged	Irregular, broken, vertical, butt edge (existing right-of-way)	Vertical, concave/horizontal
Color	Grays, tans (little exposed soil)	Greens, tans, seasonal variation	Brown
Texture	Coarse grain	Medium grain	Ordered, fine grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal, geometric pads for towers, blocky	Geometric, rectangular	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Angular, bold, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Grays, tans	Tans, gray-green	Dull gray, transparent
Texture	Fine to medium grain	Fine grained	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

**Does project design meet visual
resource management objectives?**

n/a

**Additional mitigating measures
recommended?**

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/28/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from Indian Canyon Scenic Byway (U.S. Highway 191), Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project in an enclosed landscape setting viewed from the Indian Canyon Scenic Byway. The proposed Project would cross steep terrain and would be predominately backdropped by the adjacent terrain from an inferior viewer position except where the distant ridge would be traversed. In this area, structures would be skylined in a manner similar to the existing 138kV transmission line. Disturbances associated with construction access roads and right-of-way vegetation clearing would introduce additional geometric forms into the landscape generating a moderate/strong level of contrast. The proposed structures would be seen approximately 0.5 mile away in context with a smaller 138kV transmission line. Selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would be applied to reduce landscape contrast generated by the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 17N	Location Sketch 
Key Observation Point # 275 Overland Historic Trail	Range: 94W	
VRM Class/VQO: III	Section: 21	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Gently rolling to flat, level	Low, amorphous patches	Cylindrical, low
Line	Undulating horizontal, continuous	Irregular, diffuse, indistinguishable to butt edge (at road)	Short vertical and horizontal
Color	Browns, tans, grays (road)	Greens, tans, yellows	Dark, dull green, tans
Texture	Fine grain	Fine to medium grain	Fine grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Geometric/horizontal clearings for tower pads and access	Geometric portions for tower pads and access	Bold, vertical; complex geometric/triangular
Line	Undulating horizontal	Creating butt edge at clearing	Vertical/diagonal; thin concave (conductors)
Color	Browns	Low growing greens, tans, yellows	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



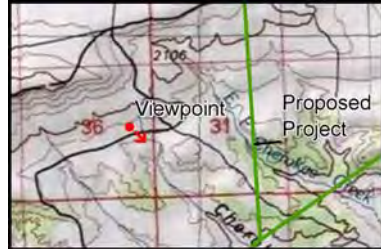
View east from Eureka Headquarters Road (adjacent to Overland Historic Trail), Wyoming

Moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting with VRM Class III designation and associated with the Overland Historic Trail along Eureka Headquarters Road. The proposed Project would be seen from a level position as is it crosses relatively flat terrain in a skylined condition. Disturbance associated with construction access and tower pads would have weak contrast with landform and vegetation elements of form, line, color, and texture. The proposed structures and conductors would be visible at approximately 1 mile and would introduce a moderate/strong structure contrast. To reduce contrast, selective mitigation measure #9 (maximize span length) would be applied to limit dominance of transmission structures being located adjacent to the trail/road and bring the proposed Project into compliance with the definition of a VRM Class III objective.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 5/3/2013
BLM Field Office/National Forest: Rawlins Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13N	Location Sketch 
Key Observation Point # 276 Cherokee Historic Trail	Range: 94W	
VRM Class/VQO: III	Section: 31	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Low, rolling	Indistinct, amorphous and geometric patches, some stippled	n/a
Line	Undulating, layered, horizontal	Indistinct, diffuse and butt edges	n/a
Color	Browns, tans	Greens, yellows, sage, tan	n/a
Texture	Fine grain	Fine to medium grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Low, rolling	Geometric, horizontal cleared portions for tower pads and access	Vertical, rhythmic; geometric/triangular
Line	Undulating horizontal, diagonal	Creating butt horizontal and diagonal edges at clearings	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Greens, yellows, tan from remaining/reseeded vegetation	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	5/3/2013
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



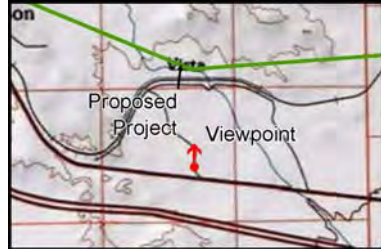
View southeast towards Cherokee Historic Trail through the Cherokee Basin, Wyoming

Moderate/strong contrast would result from the construction and operation of the proposed Project in an panoramic landscape setting with VRM Class III designation and viewed from the Cherokee Historic Trail. The proposed Project would cross varying terrain in a partially screened to skylined conditions. Disturbance to landform and vegetation associated with construction access and tower pad earthwork would have moderate contrast with landform elements of form and line with weak contrast for color and texture as thin contrasting diagonal lines would be introduced. The Project structures and conductors would be visible at 1 mile above the horizon and introduce strong contrast for structure elements of form and line with moderate contrast for color and texture. To reduce contrast, selective mitigation measure #3 (minimize ground disturbance) would be applied to minimizing slope cut and fill in the rolling terrain seen from this KOP; however, moderate/strong structure contrast would remain because of the skylined structures and conductors.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/23/2012
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 21S	Location Sketch 
Key Observation Point # 279 Old Spanish National Historic Trail (near Thompson Springs)	Range: 20E	
VRM Class/VQO: III	Section: 26	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, smooth, prominent Book Cliffs in background	Short, patchy	Vertical, regular
Line	Horizontal	Angular, broken, diffuse edges	Vertical, horizontal
Color	Tans, grays	Gray-greens, tans, browns, dull	Grays
Texture	Fine grain	Even, fine grain	Fine textured, medium density, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic; geometric/triangular
Line	Geometric, curvilinear	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/23/2012
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from two-track road east of Thompson Springs at crossing of Old Spanish Trail, Utah

Moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting as viewed from the Old Spanish National Historic Trail toward lands designated as VRM Class III. The proposed Project would cross level to rolling terrain and would be mostly backdropped by the Book Cliffs. Disturbance associated with the construction of access roads and right-of-way vegetation clearing would be intermittently screened by the raised railroad bed. Where visible, these disturbances would generate a weak landscape contrast. The proposed structures would be seen at approximately 0.7 mile from a level viewing position. The raised railroad bed and associated telegraph poles have introduced structural elements into the landscape, therefore the proposed Project would produce a moderate/strong structure contrast from this viewpoint.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/30/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 21N	Location Sketch 
Key Observation Point # 281 Rawlins to Baggs Historic Trail	Range: 88W	
VRM Class/VQO: III	Section: 34	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, level to diagonal and pyramidal, concave sloping	Low, amorphous patches	n/a
Line	Horizontal, diagonal	Irregular, diffuse and indistinguishable to butt edge (at	n/a
Color	Browns, tans, light gray (road)	Greens, tans, yellows	n/a
Texture	Fine grain	Fine to medium grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Geometric clearing cut into slope for tower pad(s) and access	Cleared geometric portions for tower pads and access	Bold, vertical, rhythmic; complex geometric/triangular
Line	Horizontal, diagonal	Creating butt edge with clearing	Vertical/diagonal, horizontal; concave (conductors)
Color	Contrasting tans from soil disturbance/exposure for clearings	Remaining or reestablished low vegetation, greens, tans, yellows	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/30/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Twenty Mile Road, Wyoming

Moderate/strong contrast would result from the construction and operation of the proposed Project in a focal/panoramic landscape setting associated with views from Twenty Mile Road and the Rawlins to Baggs Historic Trail. The proposed Project would be seen from an inferior to level viewing position as it crosses through varying sloped terrain in a skylined condition. Disturbance associated with construction access and tower pads would have weak/moderate contrast with existing landform and vegetation elements. The structures and conductors would be seen at approximately 0.5 mile and would have strong contrast with structure elements of form, line, color, and texture as portions of structures and conductors would be skylined above horizon in this natural landscape setting. To reduce contrast, selective mitigation measures #3 (minimize ground disturbance) and #9 (maximize span length) would be applied.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 21S Range: 20E Section: 26	Location Sketch 
Key Observation Point # 282 I-70 Thompson Welcome Center (Dinosaur Diamond SB)		
VRM Class/VQO: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Moderate slopes, plateaus, level Book Cliffs prominent in background	Indistinct, patches, stippled	n/a
Line	Horizontal, broken diagonal	Indistinct, irregular	n/a
Color	Tans, browns	gray-greens	n/a
Texture	Fine to medium grain	Medium grain, sparse/even	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin, triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin/weak concave (conductors)
Color	Tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from Thompson Welcome Center, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting viewed from the Thompson Welcome Center toward land designated as VRM Class III. The proposed Project would cross rolling terrain and would be backdropped by adjacent terrain from a level to slightly inferior viewing position. Disturbance associated with construction access roads and clearing of vegetation within the right-of-way would mostly be screened by the rolling terrain but where visible, would introduce geometric shapes and curvilinear lines. The proposed structures would be seen at approximately 1.1 miles and would be partially screened by topography.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 283 Energy Loop Scenic Byway (Utah State Route 31)	Range: 5E	
VRM Class/VQO: n/a	Section: 26	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rounded, rolling	Vertical, complex, amorphous	n/a
Line	Curving, continuous	Flowing, complex, irregular	n/a
Color	Tans, grays	Vivid, greens, tans, whites seasonal color	n/a
Texture	Smooth	Dense, medium grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Bold, vertical; complex geometric/triangular
Line	n/a	n/a	Vertical/diagonal, horizontal; concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View north from Energy Loop Scenic Byway (Utah State Route 31), Utah

Moderate contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting as viewed from the Energy Loop Scenic Byway. The proposed Project would cross rolling terrain and views would be mostly screened by vegetation. Construction access roads and right-of-way vegetation clearing would not be visible from this KOP due to vegetative screening. The proposed structures would be seen from approximately 0.5 mile away and where visible, the structures would be skylined. Selective mitigation measure #9 (maximize span length) would reduce contrast generated by the skylined structures by placing the structures further from the road which would increase the level of screening by the adjacent aspen groves.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/26/2012
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 284 Energy Loop Scenic Byway (Utah State Route 264)	Range: 6E	
VRM Class/VQO: Partial Retention	Section: 30	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Domed, diagonal, rounded	Vertical, pyramidal, amorphous	n/a
Line	Curving, continuous	Flowing, complex, irregular, butt edge	n/a
Color	Tans	Tans, greens, seasonal color	n/a
Texture	Medium grain	Medium grain, stippled, scattered	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, thin; geometric, triangular
Line	Curvilinear, geometric	Bold, butt edge	Vertical/diagonal; thin concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/26/2012
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from Energy Loop Scenic Byway (Utah State Route 264), Utah

Strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape designated by the Manti-La Sal National Forest as a partial retention VQO as viewed from the Energy Loop Scenic Byway. The proposed Project would cross rolling terrain and would be viewed from a slightly inferior position from this KOP. Ground disturbance associated with construction access would be visible and would introduce a moderate contrast with existing landforms. Right-of-way vegetation clearing would produce geometric forms into a landscape characterized by amorphous patches of aspen groves, therefore, the proposed Project would moderately contrast with existing vegetation patterns. The proposed structures would be seen at approximately 0.5 mile and would be partially backdropped by adjacent terrain. Selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would reduce contrast on views from this scenic road.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/30/2011
BLM Field Office/National Forest:	Uinta National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 4S	Location Sketch 
Key Observation Point # 285 Aspen Grove Campground	Range: 10W	
VRM Class/VQO: n/a	Section: 20	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rounded, moderate slope	Diverse, numerous amorphous dense patches	Low, rectangular
Line	Curving, undulating, angular	Butt and diffuse edges	Horizontal and vertical
Color	Tans, limited exposed soil	Dark greens, sage greens, tans, seasonal variety	Greens and browns
Texture	Medium grain	Medium to coarse grain	Medium grain

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Tall, vertical, geometric, transparent
Line	Geometric, curvilinear	Bold, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, additional exposed soil	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Repeating/diminishing coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/30/2011
BLM Field Office/National Forest:	Uinta National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Aspen Grove Campground (Strawberry Reservoir), Utah

Strong contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting from the Aspen Grove Campground. The proposed Project would cross steep terrain and due to the tall vegetation in the right-of-way, vegetation would be removed across the entire 250-foot wide right-of-way introducing a geometric form which is incongruent with existing vegetation patterns. The construction of construction access roads would produce curvilinear lines and geometric forms which would contrast with the existing landforms. The proposed structures would be seen at approximately 0.75 mile and would introduce strong contrast into the landscape since the existing 345kV transmission line is not visible from this campground. Selective mitigation measures #2 (limit construction of new access), #3 (minimize cut and fill) and #4 (minimize tree clearing) would be applied to reduce contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/24/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 16N	Location Sketch 
Key Observation Point # 286 Adobe Town WSA Destination Route (BLM Road 4411)	Range: 95W	
VRM Class/VQO: III	Section: 22	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Indistinct, low, rolling	Indistinct, with areas of stippling and clumping	Cylindrical
Line	Gently curving, horizontal	Indistinct, weak diffuse edges, weak butt edge (at road)	Weak vertical and horizontal silhouette
Color	Browns, tans	Greens, tans, yellow, grays	Tan
Texture	Fine to medium grain	Fine to medium grain	Fine grain, sparse, random

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Thin, vertical
Line	n/a	n/a	Thin vertical
Color	n/a	n/a	Dull gray
Texture	n/a	n/a	Uniform repeating fine grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/24/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View east from BLM Road 4411 (access to Adobe Town), Wyoming

Weak contrast would result from the construction and operation of the proposed Project in this panoramic landscape setting with VRM Class III designation as viewed from access to the Adobe Town Wilderness Study Area. The Project would be intermittently to fully screened by topography with few visible cultural modifications from oil and gas development. In locations where the proposed Project may be visible, only the top of the transmission structures would be seen approximately 6.5 miles away which would introduce a weak structure contrast.

This KOP location was chosen to represent the Adobe Town area because it is located in an area where transmission structures could be viewed in a skylined condition from a key access route for Adobe Town. Other areas where the Project could be viewed from within the Adobe Town Wilderness Study Area would likely occur where the Project would be viewed in a backdropped condition and therefore, would be visually absorbed into the landscape with less potential contrast associated with the Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/28/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 7N	Location Sketch 
Key Observation Point # 287 Moffat County Road 10 (views to Cross Mountain)	Range: 97W	
VRM Class/VQO: III	Section: 23	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, level, rugged blocky	Indistinct, stippled	n/a
Line	Straight and undulating horizontal, diagonal	Diffuse and indistinguishable with butt edges (at roads)	n/a
Color	Browns, tans, grays	Greens, tans, yellow	n/a
Texture	Fine to coarse grain	Fine to medium grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic and diminishing; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns, tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/28/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View west toward Cross Mountain from Moffat County Road 10, Colorado

Moderate/strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting with VRM Class III designation associated with recreation access to the Cross Mountain Wilderness Study Area. Views toward Cross Mountain, distant landscape in the photo, are especially important from this key observation point. The proposed Project would be viewed from a slightly inferior viewing position as it crosses flat to rolling terrain with partial backdropping. Disturbance associated with construction access as well as vegetation clearing in the right-of-way would be mostly screened from view but where visible, would introduce curvilinear lines and geometric forms. The proposed structures would be seen approximately 0.75 mile away with partial backdropping of the structures south of the road (Cross Mountain) while structures to the north of the road would be skylined. To reduce contrast, selective mitigation measure #9 (maximize span length) would be applied to limit dominance of transmission structures being located adjacent to the road.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/28/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 12N	Location Sketch 
Key Observation Point # 288 Colorado State Highway 13 (views to Bakers Peak)	Range: 91W	
VRM Class/VQO: III	Section: 8	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Indistinct, low, rolling, blocky	Indistinct, clumping with areas of stippling	Thin vertical, geometric, rectangular (buildings)
Line	Gently curving, straight and undulating horizontal	Indistinct, weak diffuse edges and butt edges (at roads, fence lines)	Vertical, diagonal, horizontal
Color	Browns, tans	Greens, tans, yellow	Subtle grays, browns, whites
Texture	Fine grain	Fine to medium grain	Fine grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Minimal disturbance for geometric tower pads and access through flat	Cleared geometric patches of low reestablished vegetation at tower	Vertical, thin, triangular
Line	Diagonal	Diagonal	Vertical/diagonal; thin/weak concave (conductors)
Color	Tans	Tans, greens	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/28/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Wyoming-Colorado Border on Colorado State Highway 13

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape designated by the BLM as VRM Class III as viewed from the Wyoming/Colorado border on Colorado State Highway 13. The proposed Project would cross flat to slightly rolling terrain and would be viewed from a superior position with the proposed Project in a backdropped condition. Disturbance associated with construction access to landform and vegetation would be visible and introduce weak contrast to landform and vegetation elements of form, line, color, and texture as similar conditions currently exist from this view. The proposed structures would be seen at approximately 2 miles and would introduce moderate contrast to structure elements of form and line with weak contrast to color and texture in a largely intact landscape with some modifications from oil/gas development and rangeland improvements.

Where the project would be viewed from Colorado State Highway 13 in close proximity and in a parallel condition to the highway, contrast would increase. The stronger contrast combined with the long duration views while traveling parallel to the Project would not be compliant with visual resource management objectives.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 5/2/2013
BLM Field Office/National Forest: Little Snake Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 8N	Location Sketch 
Key Observation Point # 289 Godiva Rim	Range: 97W	
VRM Class/VQO: III	Section: 20	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rounded, moderate slopes	Amorphous patches and clumped groupings	n/a
Line	Diagonal, curving	Bold butt and Indistinct to weak diffuse edges a	n/a
Color	Tans, beige	Greens, tans, grays, yellow, tan	n/a
Texture	Fine to medium grain	Medium to coarse	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Thin continuous diagonal and geometric clearings for tower pads	Thin continuous diagonal patch(es) of low reestablished vegetation at	Vertical, rhythmic; geometric/triangular
Line	Diagonal	Diagonal thin butt edge at clearing for access and tower pads	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	5/2/2013
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View east from Godiva Rim Road, Colorado

Moderate/strong contrast would result from the construction and operation of the proposed Project in a feature landscape setting associated with the Godiva Rim. The proposed Project would be visible from a level position as it crosses sloped terrain. Disturbance associated with construction access and tower pads would have weak contrast with landform and vegetation elements of form, line, color, and texture. The proposed structures and conductors would be visible at approximately 0.7 mile and have strong contrast with structure elements of form and line with moderate contrast with color, and texture as structures would be seen above the horizon in this natural landscape setting. Selective mitigation measure #3 (minimize ground disturbance) would reduce contrast on views resulting from the construction of access roads; however, moderate/strong structure contrast would remain because of the skylined structures and conductors.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	5/2/2013
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 10N	Location Sketch 
Key Observation Point # 290 Moffat County Road 75 (recreation access)	Range: 97W	
VRM Class/VQO: III	Section: 11	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	FG: Low, rugged, blocky, braided BG: Indistinct, low, rolling	FG: Indistinct, amorphous with areas of stippling	n/a
Line	FG: Irregular, angular, banding, curving	FG: Indistinct, diffuse BG: Curvilinear, weak diffuse edges	n/a
Color	FG: Browns, tans, reflective BG: Browns, tans	FG: Sage greens, tans BG: Dark greens, sage greens, tans	n/a
Texture	FG: Smooth, medium to coarse grain BG: Fine grain	FG: Medium grain BG: Fine to medium grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Thin, vertical
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical
Color	Browns, tans	Sage greens, tans	Dull gray
Texture	Fine grain	Fine grain	Uniform repeating fine grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

**Does project design meet visual
resource management objectives?**

No

**Additional mitigating measures
recommended?**

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	5/2/2013
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from Moffat County Road 75, Colorado

Due to the relocation of the Project off of Sevenmile Ridge, views toward the Project are mostly screened by topography along the Sevenmile Destination Route (proposed backcountry byway). As such, this key observation point was selected to display the potential contrast introduced by the Project at an overlook along this destination route with views of the Little Snake River. A weak contrast would result from the construction and operation of the proposed Project within a focal, panoramic landscape with VRM Class III designation and associated with Moffat County Road 75. The proposed Project would be seen from a superior viewing position as it crosses through a level area adjacent to the Little Snake River in the background beyond the two adjacent ridge landscapes. Disturbance associated with construction access and tower pads would introduce weak contrast into the landscape, where visible, through the geometric forms of these activities. The proposed structures and conductors would be visible 5 miles away and introduce a weak contrast since they would be backdropped by adjacent landscapes. The alternative route variation would introduce a lower level of contrast since the proposed Project would be located approximately 6 miles away from this viewpoint.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6N Range: 88W Section: 7	Location Sketch 
Key Observation Point # 291 Yampa River State Park		
VRM Class/VQO: n/a		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat to gently rolling	Amorphous and geometric patches, Clumped vertical/tall	Thin vertical, geometric/rectangular
Line	Horizontal, diagonal	Butt edges	Vertical, broken horizontal
Color	Light browns	Greens, yellow, tans, browns	Grays, brown
Texture	Fine grain	Fine to coarse grain	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	n/a
Line	n/a	n/a	n/a
Color	n/a	n/a	n/a
Texture	n/a	n/a	n/a

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View west from Yampa River State Park, Colorado

Due to the distant view, over 5 miles from the proposed Project as well as vegetation and topographic screening, views from this portion of the Yampa River State Park would have no perceivable contrast from the construction and operation of the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/7/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 21N	Location Sketch 
Key Observation Point # 295 Fort Steele Historic Site	Range: 85W	
VRM Class/VQO: III	Section: 23	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Low blocky to flat	Band/strip, amorphous and geometric patches	Thin vertical and horizontal, geometric/rectangular
Line	Undulating horizontal, diagonal	Diffuse and butt edges	Vertical, horizontal, diagonal
Color	Browns, tans	Dull and dark greens, yellows	Browns, subtle grays, greens, whites, reds
Texture	Fine to medium grain	Fine to coarse grain	Coarse grain, medium density groupings

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Thin, vertical
Line	n/a	n/a	Thin, vertical; thin/weak concave (conductors)
Color	n/a	n/a	Dull gray
Texture	n/a	n/a	Uniform repeating medium grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/7/2011
BLM Field Office/National Forest:	Rawlins Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Fort Steele Cemetery, Wyoming

Weak contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting with a VRM Class IV designation as viewed from the Fort Steele State Historic Site. The proposed Project would cross low rolling terrain in an intermittently screened condition with portions of the proposed Project occurring in both backdropped and skylined conditions. Construction access and tower pad disturbance in the landform and vegetation components of contrast would not be visible from this KOP. The proposed structures would be seen approximately 2.5 miles away beyond an existing 230kV transmission line and interstate highway. Due to the distance of these views to the proposed Project and the existing cultural modifications, the structures would introduce weak structure contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 7N	Location Sketch 
Key Observation Point # 297 Elkhead Reservoir Campground	Range: 89W	
VRM Class/VQO: n/a	Section: 16	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Gently sloping, rolling, Flat	Low, amorphous patches, stippled in areas	Bold geometric
Line	Gently curving, undulating and straight horizontal	Diffuse ad butt edges	Straight, angular, vertical diagonal
Color	Browns, grays, bluish-gray, reflective	Variations of greens, yellow, tan, browns	Browns, tans, black
Texture	Fine grain, smooth	Fine to medium grain	Coarse grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Thin, vertical
Line	n/a	n/a	Thin, vertical; thin/weak concave (conductors)
Color	n/a	n/a	Dull gray
Texture	n/a	n/a	Uniform repeating medium grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/29/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View west from Elkhead Reservoir Campground, Colorado

Weak contrast would occur from the construction and operation of the proposed Project within a panoramic landscape setting associated with recreational users at Elkhead Reservoir. The proposed Project would be intermittent to entirely screened by topography including construction access roads and any vegetation clearing within the right-of-way. In locations where the transmission structures may be seen, only the top portions of the structures would be visible from approximately 2.5 miles away which would introduce a weak structure contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/27/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6N	Location Sketch 
Key Observation Point # 299 Yampa River Access for Cross Mountain	Range: 97W	
VRM Class/VQO: III	Section: 8	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Indistinct, low rolling, blocky	Indistinct, amorphous and geometric patches, areas of stippling	n/a
Line	Gently curving, sloping horizontal, layered horizontal	Butt edge (at road) to weak diffuse edges	n/a
Color	Browns, tans, reds	Greens, tans, yellow	n/a
Texture	Fine to medium grain	Fine grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Thin, vertical
Line	n/a	n/a	Thin, vertical; thin/weak concave (conductors)
Color	n/a	n/a	Dull gray
Texture	n/a	n/a	Uniform repeating medium grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northeast from the East Cross Mountain/Yampa River access road, Colorado

Weak contrast would result from the construction and operation of the proposed Project within a panoramic landscape with VRM Class III designation and associated with access to the Yampa River and Cross Mountain Gorge. The proposed Project would be viewed from a level position as it traverses through rolling terrain in a partially backdropped condition. Disturbance associated with construction access and tower pads as well as right-of-way vegetation clearing would not be visible from this viewpoint. The proposed structures and conductors would be seen along the horizon at 2.5 miles away and due to the distance from this viewpoint, would produce a weak structure contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/5/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 23S Range: 20E Section: 14	Location Sketch 
Key Observation Point # 301 Arches National Park (Salt Valley Road)		
VRM Class/VQO: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	FG: Flat, smooth BG: Bold and rectangular	FG: Short and uniform BG: Scattered and diffuse	n/a
Line	FG: Horizontal BG: Horizontal banding, angular	FG: Indistinct, weak BG: Angular, broken, diffuse edges	n/a
Color	FG: Reds BG: Reds, tans	FG: Tans grasses, green shrubs Gray-greens, dull	n/a
Texture	FG: Smooth BG: Moderate to rough textures	FG: Even, medium grain BG: Rough textured scattered	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	n/a
Line	n/a	n/a	n/a
Color	n/a	n/a	n/a
Texture	n/a	n/a	n/a

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/5/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from Salt Valley Road (access to Arches National Park), Utah

Due to the distant view, over 13 miles from the proposed Project and topographic screening, views from the Salt Valley portion of Arches National Park would have no perceivable contrast produced by the construction and operation of the proposed project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/14/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6N	Location Sketch 
Key Observation Point # 302 Yampa River (Juniper Canyon)	Range: 95W	
VRM Class/VQO: III	Section: 12	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Bold meandering band, rugged/blocky, V-shaped	Amorphous patch, strips, stippled	vertical; complex geometric/triangular
Line	Curving, angular, jagged, diagonal, horizontal	Weak, indistinct	Vertical/diagonal; thin concave (conductors)
Color	Tans, browns, blue, reflective	Greens, yellow, tan	Gray, transparent
Texture	Medium to coarse grain to smooth	Medium grain	Medium to coarse grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Tans, browns	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/14/2011
BLM Field Office/National Forest:	Little Snake Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



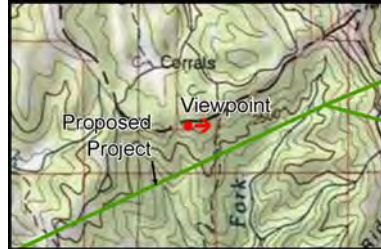
View northwest from Juniper Canyon, Colorado

Moderate contrast would result from the construction and operation of the proposed Project within a feature landscape setting with VRM Class III designation and associated with the Yampa River. The proposed Project would be viewed from a level position as it traverses rolling terrain in a skylined condition similar to the adjacent transmission lines. Disturbance associated with construction access and tower pads as well as right-of-way vegetation clearing would be mostly screened from this viewpoint but where visible, would introduce weak geometric forms. Moderate/strong structure contrast would occur where the structures would be skylined at the crossing of the river. Existing transmission lines of similar size and scale would be seen behind the proposed Project. To reduce contrast, selective mitigation measure #9 (maximize span length) would be applied to reduce the visual dominance of the proposed structures as viewed from the river and therefore, bring the proposed Project into compliance with a VRM Class III objective.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/30/2011
BLM Field Office/National Forest:	Uinta National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 9S	Location Sketch 
Key Observation Point # 304 Sheep Creek Road (FR 042)	Range: 6E	
VRM Class/VQO: Partial Retention	Section: 15	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Bold, prominent, rugged	Geometric and amorphous patches, stippled in areas	Vertical, rhythmic; complex geometric/triangular
Line	Diagonal, undulating, bold	Irregular and regular butt edges, diffuse edges	Vertical/diagonal, horizontal; concave (conductors)
Color	Subtle, tans, grays	Dark green, grays (trees), light green and tans (grasses)	Gray, transparent
Texture	Medium to coarse grain	Medium to coarse grain	Repeating coarse to medium grain and density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, rhythmic; complex geometric/triangular
Line	Curvilinear, geometric	Bold, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, grays	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/30/2011
BLM Field Office/National Forest:	Uinta National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View east from Sheep Creek Road in the Uinta National Forest, Utah

Moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated by the Uinta-Wasatch-Cache National Forest as a partial retention VQO as viewed from Sheep Creek Road. The proposed Project crosses steep terrain and would be backdropped by terrain except for the structures located along the top of the ridge. Disturbance associated with construction access would introduce curvilinear lines and geometric forms that would contrast with existing landform patterns. Vegetation clearing in the right-of-way would produce additional geometric forms consistent with the adjacent transmission line corridor. The proposed structures would be seen at approximately 0.5 mile in context with an existing 345kV transmission line. Selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would reduce landscape contrast produced by the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 19S	Location Sketch 
Key Observation Point # 305 Wedge Overlook Scenic Backway	Range: 10E	
VRM Class/VQO: III	Section: 22	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, smooth, Cedar Mountain prominent in background	Short, patchy	Thin, vertical
Line	Horizontal	Angular, broken, diffuse edges	Vertical
Color	Tans, beiges	Gray-greens, dull	Brown
Texture	Fine grain	Even, medium grain	Uniform repeating fine grain, medium to sparse density, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin, triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin/weak concave (conductors)
Color	Tans, beiges	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform repeating, medium grain, medium to sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from Wedge Overlook Scenic Backway, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape designated as VRM Class III as viewed from the Wedge Overlook Scenic Backway. The proposed Project crosses flat terrain and would be mostly backdropped by the adjacent terrain. Disturbance associated with construction access would introduce a horizontal line and geometric forms into the landscape. Vegetation clearing would be limited to tower pads and access roads, which would introduce additional geometric forms contrasting with existing vegetation patterns. The proposed structures would be seen approximately 2 miles away adjacent to an existing 345kV transmission line, therefore, a weak/moderate structure contrast would be produced by the proposed Project.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/23/2012
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 21S	Location Sketch 
Key Observation Point # 306 Upper Colorado River Scenic Byway	Range: 23E	
VRM Class/VQO: II	Section: 32	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, smooth, Book Cliffs prominent in background	Short, patchy	n/a
Line	Horizontal, elevated railroad line	Angular, broken, diffuse edges	n/a
Color	Tans, beiges, grays	Tans, gray-greens, dull	n/a
Texture	Fine grain	Even, medium grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, thin; geometric, triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/23/2012
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from Upper Colorado River Scenic Byway west of Cisco, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class II and viewed from the intersection of the Upper Colorado River Scenic Byway and Interstate 70. The proposed Project traverses level terrain and would be backdropped by the distant Book Cliffs landscape. Disturbance associated with construction access and vegetation clearing in the right-of-way would be mostly screened by the elevated railroad line but where visible, would introduce weak geometric forms into the landscape. The proposed structures would be seen at 0.6 mile from a level viewing position in context with an interstate highway and railroad line which have modified the local landscape character.

Note: The Moab Field Office manages VRM Class II areas within designated utility corridors as VRM Class III for utility projects as stated in their 2008 RMP.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/27/2012
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 13S	Location Sketch 
Key Observation Point # 307 Energy Loop Scenic Byway	Range: 6E	
VRM Class/VQO: Partial Retention	Section: 27	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Diagonal, bold, rounded	Vertical, complex, pyramidal, amorphous	n/a
Line	Curving, continuous, angular	Flowing, complex, irregular, butt edge in background (right-of-way	n/a
Color	Tans	Vivid, tans, greens, gray-green	n/a
Texture	Medium grain	Coarse, stippled, scattered	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric	Bold, vertical; complex geometric/triangular
Line	Curvilinear, horizontal	Horizontal, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2012
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View north from Energy Loop Scenic Byway (Utah State Route 264), Utah

Strong contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting designated by the Manti-La Sal National Forest as a partial retention VQO. The proposed Project crosses steep terrain and would be skylined along the top of adjacent ridgelines. Disturbance associated with the construction of access and tower pads would introduce curvilinear lines and geometric forms into the landscape. Vegetation clearing in the right-of-way would produce a geometric form with a butt edge against existing vegetation. The proposed structures would be seen at approximately 0.5 mile and would dominate views from the Energy Loop Scenic Byway. Selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would reduce landscape contrast generated by the proposed Project. By maximizing the span length between towers across this scenic road (selective mitigation measure #9), structure contrast would be reduced by limiting the visual dominance of transmission structures being located adjacent to the road.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 9/27/2011
BLM Field Office/National Forest: Manti-La Sal National Forest
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 16S	Location Sketch 
Key Observation Point # 308 Millers Flat Road	Range: 6E	
VRM Class/VQO: Modification	Section: 16	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rounded, diagonal, bold	Vertical, complex, pyramidal, amorphous	Vertical, geometric, transparent
Line	Curving, continuous	Butt edge, flowing, complex, irregular	Vertical/diagonal; thin concave (conductors)
Color	Tans, grays	Vivid, greens, tans, seasonal variation	Brown, gray, transparent
Texture	Medium grain	Medium to coarse grain, dense	Uniform medium grain, medium density,

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, thin; geometric, triangular
Line	Curvilinear, geometric	Horizontal, bold, butt edge	Vertical/diagonal; thin concave (conductors)
Color	Tans, grays	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/27/2011
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View north from Millers Flat Road, Utah

Moderate contrast would result from the construction and operation of the proposed Project within a partially enclosed landscape setting designated by the Manti-La Sal National Forest as a modification VQO viewed from Miller Flat Road. The proposed Project crosses moderately steep terrain and would be partially skylined across the hill north of the viewpoint. Disturbance associated with construction access would introduce geometric forms and curvilinear lines not visible in the existing transmission line corridor. Right-of-way vegetation clearing associated with the proposed Project would be approximately twice as wide as the existing transmission line right-of-way. Due to this additional width, a more defined geometric form would be produced by the proposed Project. The proposed structures would be seen 0.8 mile away from an inferior viewing position in context with an existing 345kV transmission line. Application of selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would reduce landscape contrast produced by access road construction and right-of-way vegetation clearing.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/26/2012
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 16S	Location Sketch 
Key Observation Point # 309 Bear Creek Campground	Range: 7E	
VRM Class/VQO: Partial Retention	Section: 35	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rugged, dissected, ridges	Amorphous, stippled areas	Vertical, rhythmic; geometric/triangular
Line	Complex, diagonal, horizontal banding	Butt and diffuse edges	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Tans, grays	Light and dark greens, tans	Brown, reflective gray
Texture	Medium to coarse grain	Medium to coarse grain	Repeating fine to medium grain, medium density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Vertical, rhythmic; geometric/triangular
Line	Curvilinear, geometric	Diagonal, butt edge	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Tans, grays	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating fine grain, sparse density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

**Does project design meet visual
resource management objectives?**

Yes

**Additional mitigating measures
recommended?**

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/26/2012
BLM Field Office/National Forest:	Manti-La Sal National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from the Bear Creek Campground, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a partially enclosed landscape setting designated by the Manti-La Sal National Forest as a partial retention VQO viewed from the Bear Creek Campground. The proposed Project crosses steep terrain and would be skylined on the distant ridgeline. Disturbance associated with construction access would produce geometric forms and curvilinear lines that would contrast with the existing landscape character. Vegetation clearing in the right-of-way would develop geometric forms that would be incongruent with the existing vegetative patterns. The proposed structures would be seen at approximately 2 miles from an inferior viewing position in context with existing transmission lines (which are screened from this viewing position but are visible at various locations within the campground).

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 5/2/2013
BLM Field Office/National Forest: White River Field Office
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 1S	Location Sketch 
Key Observation Point # 310 Crooks Brand Rock Art Site	Range: 102W	
VRM Class/VQO: IV	Section: 8	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Horizontal, rounded	Amorphous patches	Cylindrical
Line	Continuous, horizontal	Diffuse to butt edges from juniper stands	Vertical
Color	Browns, tans	Light tan (grasses), dark green (juniper)	Tans
Texture	Fine to medium grain	Fine to patchy, coarse	Fine grain

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Butt edge, broken, regular	Vertical/diagonal; thin concave (conductors)
Color	Browns, tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	5/2/2013
BLM Field Office/National Forest:	White River Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Crooks Band Rock Art Site

Moderate to moderate/strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class IV as viewed from the Crook's Brand Rock Art Site. The proposed Project crosses gently rolling terrain and would be mostly backdropped by adjacent terrain. Disturbance associated with construction access would introduce curvilinear forms consistent with the existing landscape character. Vegetation clearing in the right-of-way would produce geometric forms with butt edges through existing amorphous patches of pinyon-juniper. The proposed structures would be seen at approximately 0.4 mile from a level viewing position.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/11/2011
BLM Field Office/National Forest:	Grand Junction Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 10S	Location Sketch 
Key Observation Point # 312 Rabbit Valley Dispersed Campsite	Range: 104W	
VRM Class/VQO: IV	Section: 17	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Shallow slopes, undulating	Indistinct, patches, stippled	n/a
Line	Horizontal, broken diagonal	Indistinct	n/a
Color	Tans	Tans, gray greens, dark greens	n/a
Texture	Fine to medium grain	Medium grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic; geometric/triangular
Line	Geometric, curvilinear	Indistinct, broken, regular	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/11/2011
BLM Field Office/National Forest:	Grand Junction Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from a dispersed campsite in Rabbit Valley (McInnis Canyons NCA), Colorado

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class IV as viewed from a dispersed recreation site adjacent to Rabbit Valley in the McInnis Canyons National Conservation Area. The proposed Project crosses rolling terrain and would be backdropped by adjacent terrain. Disturbance associated with construction access would introduce geometric forms and curvilinear lines into the landscape. Due to the low-growing existing vegetation, clearing would be limited to geometric forms as a result of the construction of access roads and tower pads. The proposed structures would be seen 1.4 miles away from a slightly superior viewing position and would produce a moderate level of structure contrast.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/5/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 21S	Location Sketch 
Key Observation Point # 313 Interstate 70 crossing	Range: 17E	
VRM Class/VQO: III	Section: 28	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rolling, horizontal, plateaus	Few, stippled	n/a
Line	Horizontal, curving, diagonal, angular	Weak diffuse, indistinct	n/a
Color	Tans, grays, reds	Tans, greens	n/a
Texture	Medium to coarse grain	Fine grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; weak concave (conductors)
Color	Tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/5/2011
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southeast from Interstate 70 east of Green River, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III viewed from Interstate 70. The proposed Project crosses flat to gently rolling terrain and would be mostly backdropped by adjacent terrain. Disturbance associated with construction access would weakly introduce curvilinear lines and geometric forms into the landscape. Due to the presence of low-growing vegetation within the right-of-way, vegetation clearing would be mostly limited to tower pads and access roads where geometric forms would produce a weak landscape contrast. The proposed structures would be seen at approximately 1.5 miles from a slightly superior viewer position.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/4/2012
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 20S Range: 10E Section: 12	Location Sketch 
Key Observation Point # 314 Little Grand Canyon Overlook		
VRM Class/VQO: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, smooth, Cedar Mountain prominent in background	Short, patchy, stippled	Thin, vertical
Line	Horizontal, angular	Angular, broken, diffuse edges	Thin Vertical
Color	Tans, reds, beiges	Dark greens, gray-greens	Brown
Texture	Fine grain	Even, medium grain	Fine grain, medium density, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Thin, vertical
Line	Curvilinear, geometric	Indistinct, broken, regular	Thin vertical
Color	Tans, beiges	Sage greens, tans	Dull gray
Texture	Fine grain	Fine grain	Uniform repeating medium to fine grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/4/2012
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from Little Grand Canyon Overlook, Utah

Weak contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III viewed from the Little Grand Canyon Overlook. The proposed Project crosses flat to gently rolling terrain and would be backdropped by adjacent terrain. Disturbance associated with construction access and vegetation clearing within the right-of-way, if perceivable, would weakly introduce curvilinear lines and geometric forms consistent with those associated with the existing transmission line. The proposed structures would be seen over 5 miles away from a level viewing position in context with an existing 345kV transmission line. Due to the distance from the viewpoint to the proposed Project, structure contrast was assessed to be weak.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date: 5/2/2013
BLM Field Office/National Forest: Ashley National Forest
Resource Area:
Activity (program): 500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 6S	Location Sketch 
Key Observation Point # 315 Sowers Canyon Road	Range: 5W	
VRM Class/VQO: Modification	Section: 8	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	V-shaped, bold, steep, level valley	Numerous, irregular	Vertical, geometric
Line	Diagonal, angular, jagged, horizontal	Butt and diffuse edges	Vertical, horizontal; concave (conductors)
Color	Tans, beiges	Variety of greens, tans, little seasonal variation	Brown
Texture	Medium, granular, fine grain in valley	Random, scattered, fine to medium grain	Repeating medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical, rhythmic; complex geometric/triangular
Line	Geometric, curvilinear	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, beiges	Tans, gray-greens	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	5/2/2013
BLM Field Office/National Forest:	Ashley National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



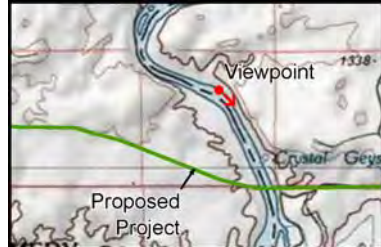
View southwest from Sowers Canyon Road, Utah

Moderate contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting designated by the Ashley National Forest as a modification VQO viewed from Sowers Canyon Road. The proposed Project crosses flat terrain along the bottom of the canyon and would be backdropped by the canyon walls. Disturbance associated with construction access would introduce geometric and curvilinear elements into the landscape which would weakly contrast with existing features. Due to the low-growing vegetation, right-of-way vegetation clearing would be mostly limited to construction access roads and tower pads which would produce weak geometric forms. The proposed structures would be located directly adjacent to this viewpoint and due to this proximity, would be skylined from a level viewing position.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/24/2012
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 21S	Location Sketch 
Key Observation Point # 319 Green River	Range: 16E	
VRM Class/VQO: III	Section: 34	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Curving band(river), rolling to level	Continuous strip of riparian vegetation, small stippled beyond	Vertical, geometric
Line	Complex, diagonal, horizontal	Undulating, weak, diffuse edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns, tans, reds, reflective	Variety of greens, browns	Brown
Texture	Rippled to smooth, glossy (river), rough, striated	Fine to medium grain (river corridor), sparse, medium grain	Medium grain, sparse, uniform, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical, rhythmic and diminishing; complex
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns, tans, reds	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/24/2012
BLM Field Office/National Forest:	Moab Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southeast from the Green River north of Crystal Geyser, Utah

Moderate contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting with views toward VRM Class III lands from the Green River. The proposed Project would traverse rolling terrain and would be partially skylined on the west side of the river and mostly screened on the east side. Disturbance associated with construction access and vegetation clearing in the right-of-way would be mostly screened by topography. In locations where these disturbances would be visible, they would introduce weak geometric forms and curvilinear lines into a landscape characterized by rolling terrain and low-growing vegetation. The proposed structures would be seen at approximately 0.75 mile from an inferior viewing position in context with an existing 345kV transmission line. To reduce structure contrast, the towers crossing the river would be placed at their maximum span distance (selective mitigation measure #9) so fewer structures would be visible from this viewpoint.

Note: As stated in the 2008 Moab RMP, VRM Class II lands within the utility corridor are treated as VRM Class III for utility projects.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 19S	Location Sketch 
Key Observation Point # 320 Junction of Road to Buckhorn Wash	Range: 10E	
VRM Class/VQO: III	Section: 13	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, smooth, Cedar Mountain prominent in background	Short, patchy	Vertical, geometric
Line	Horizontal	Angular, broken, diffuse edges	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, beiges, reds	Gray-greens, dull	Brown
Texture	Fine grain	Even, medium grain	Fine grain, medium density, repeating

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, beiges	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/4/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from Buckhorn Draw Scenic Backway

Weak/moderate to moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III and viewed from the Buckhorn Draw Scenic Backway. The proposed Project crosses flat to gently rolling terrain and would be mostly backdropped by adjacent terrain. Disturbance associated with construction access would introduce geometric forms and curvilinear lines into the landscape, weakly contrasting with existing patterns. Due to the low-growing vegetation present in the right-of-way, vegetation clearing would be mostly limited to tower pads and access roads. The proposed structures would be seen at approximately 0.75 mile and viewed from a level viewing position with an existing 345kV transmission line located beyond the proposed Project. Therefore, structure contrast was assessed to be at a moderate level from this viewpoint.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/5/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 16S	Location Sketch 
Key Observation Point # 322 U.S. Highway 6 Rest Area (Dinosaur Diamond SB)	Range: 13E	
VRM Class/VQO: IV	Section: 23	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Shallow to moderate slopes, rolling	Indistinct, amorphous, stippled	Vertical, geometric
Line	Horizontal, diagonal, undulating	Indistinct, regular	Thin vertical, angular, horizontal
Color	Tans	Dark greens, tans	Brown
Texture	Fine to medium grain	Medium grain, grouped	Medium grain, sparse

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Vertical, thin; geometric, triangular
Line	n/a	n/a	Vertical/diagonal; thin concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/5/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View west from rest area on U.S. Highway 6 south of Wellington, Utah

Weak/moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class IV as viewed from a rest area on U.S. Highway 6. The proposed Project crosses rolling terrain and would be backdropped by adjacent terrain. Disturbance associated with construction access and vegetation clearing in the right-of-way would be screened by topography and vegetation from this KOP. The proposed structures would be seen at approximately 1 mile from a slightly superior viewing position in context with an existing 138kV transmission line which is intermittently screened.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	10/12/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 20S Range: 13E Section: 11	Location Sketch 
Key Observation Point # 323 Old Railroad Grade (adjacent to Mexican Mountain WSA)		
VRM Class/VQO: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rugged to level, rolling	Indistinct, patches, stippled	Vertical, geometric, rhythmic
Line	Horizontal, diagonal, angular, undulating	Indistinct	Vertical/diagonal, horizontal; concave (conductors)
Color	Reds, browns, tans, whites	Dark greens, tans	Browns
Texture	Fine to medium grain, striated	Medium grain, uneven random	Repeating medium grain, medium density,

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical, rhythmic; complex geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, reds, lighter colored soils	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	10/12/2011
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View northwest from the Old Railroad Grade adjacent to the Mexican Mountain WSA, Utah

Moderate contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III as viewed from the Old Railroad Grade adjacent to the Mexican Mountain Wilderness Study Area. The proposed Project crosses rolling terrain and would be partially backdropped by the adjacent terrain except where the proposed structures would be located on top of the plateau northwest of the KOP. In this area, the proposed Project would be skylined. Disturbance associated with construction access would introduce dominant curvilinear lines that would expose lighter colored soils on the plateau. Contrast produced by vegetation clearing in the right-of-way would be weak due to the presence of scattered, low-growing vegetation. The proposed structures would be seen at 0.3 mile from a level to inferior viewing position in context with an existing 345kV transmission line. By rerouting the proposed Project off of the plateau (selective mitigation measure #7), the skylined structures would become more backdropped thereby reducing contrast and becoming compliant with VRM Class III. To further reduce contrast, the proposed Project would use the H-frame alternative structure type which would decrease the variety of different transmission structure types viewed in this area.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/23/2012
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 18S	Location Sketch 
Key Observation Point # 324 Dinosaur Diamond SB (U.S. HWY 6 N of Woodside)	Range: 14E	
VRM Class/VQO: III	Section: 4	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	FG: Rolling, smooth BG: Bold, vertical, rugged	FG: Short, patchy BG: Few, stippled	Vertical, geometric
Line	FG: Undulating, angular BG: Horizontal banding, diagonal,	FG: Angular, broken, diffuse edges BG: Weak diffuse, indistinct	Angular, concave, horizontal
Color	FG: Tans, beiges BG: Tans, grays, reds	FG: Gray-greens, brighter greens along riparian corridor	Brown
Texture	FG: Fine grain BG: Banded, medium grain	FG: Random, medium grain BG: Fine to medium grain	Medium grain, dense, matted, uniform, ordered

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Vertical, rhythmic and diminishing; geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans, beiges	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse to medium grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

**Does project design meet visual
resource management objectives?**

No

**Additional mitigating measures
recommended?**

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/23/2012
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Dinosaur Diamond Scenic Byway (U.S. Highway 6) north of Woodside, Utah

Moderate to moderate/strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III as viewed from U.S. Highway 6. The proposed Project crosses rolling terrain and would be partially backdropped by adjacent terrain as it parallels the scenic highway. Disturbance associated with construction access would introduce curvilinear lines and geometric forms into the landscape. Due to the low-growing vegetation, right-of-way vegetation clearing would be mostly limited to tower pads and access roads. Therefore, the geometric shapes produced by vegetation clearing would weakly contrast with existing vegetation patterns. The proposed structures would be seen 0.7 mile away from a slightly superior viewing position in context with an existing 138kV transmission line.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	9/28/2012
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 11S	Location Sketch 
Key Observation Point # 325 Argyle Canyon Residences	Range: 11E	
VRM Class/VQO: n/a	Section: 9	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rounded, moderate slope	Numerous, irregular	Vertical, geometric
Line	Curving, undulating, angular	Broken, flowing, vertical, angular	Vertical, horizontal, concave (conductors)
Color	Tans	Variety of greens, tans, seasonal variation	Browns
Texture	Medium grain	Random, scattered, medium to coarse grain	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Bold, vertical, rhythmic and diminishing; complex
Line	Curvilinear, geometric	Angular, bold, butt edge	Vertical/diagonal, horizontal; concave (conductors)
Color	Tans and grays	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating/diminishing coarse grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	9/28/2012
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from residences in Argyle Canyon, Utah

Strong contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting viewed from residences in Argyle Canyon. The proposed Project would cross moderately steep slopes adjacent to an existing 138kV transmission line but since the proposed Project would be skylined on the ridgeline, it would dominate views from these residences. Due to the presence of tall vegetation in the right-of-way, vegetation would be removed across the entire 250-foot wide right-of-way introducing a geometric form which is incongruent with existing vegetation patterns as views of the existing transmission line right-of-way are mostly screened from view. The construction of access roads and tower pads would produce curvilinear lines and geometric forms which would contrast with the existing landforms. The proposed structures would be seen 0.2 mile away and would introduce strong contrast into the landscape since the existing 138kV transmission line is mostly screened from view at this location. Selective mitigation measures #3 (minimize cut and fill) and #4 (minimize tree clearing) would be applied to reduce contrast. To further reduce contrast, the proposed structure type would be modified to use the shorter, H-frame alternative structure type to utilize vegetation screening to the extent practicable.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	7/23/2012
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 19S	Location Sketch 
Key Observation Point # 326 San Rafael Swell Destination Route	Range: 10E	
VRM Class/VQO: III	Section: 13	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Rugged, rolling, geometric	Indistinct, patches, stippled	n/a
Line	Horizontal, diagonal, angular, undulating	Indistinct	n/a
Color	Reds, browns, tans	Tans, dark greens	n/a
Texture	Fine to medium grain, striated	Fine to medium grain, uneven random	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Low, rectangular clearings (tower pads)	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Indistinct, broken, regular	Vertical/diagonal, horizontal; concave (conductors)
Color	Browns, tans	Sage greens, tans	Dull gray, transparent
Texture	Fine grain	Fine grain	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

No

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	7/23/2012
BLM Field Office/National Forest:	Price Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View north from Green River Cutoff Road (San Rafael Swell Destination Route), Utah

Strong contrast would result from the construction and operation of the proposed Project within an enclosed landscape setting designated as VRM Class III and viewed from the Green River Cutoff Road which provides access into the San Rafael Swell from U.S. Highway 6. The proposed Project would be seen from a level view with structures and conductors skylined as it crosses through relatively flat terrain. Disturbance associated with construction access and tower pads would weakly contrast with existing landform characteristics. Contrast produced by vegetation clearing in the right-of-way was assessed to be weak due to the scattered, low-growing vegetation which would be modified minimally by the proposed Project. The proposed structures would be seen directly adjacent to the road and therefore, the skylined structures would dominate views from this road.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	8/21/2013
BLM Field Office/National Forest:	Ashley National Forest
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 7S	Location Sketch 
Key Observation Point # 327 Avintaquin Campground	Range: 8W	
VRM Class/VQO: Retention	Section: 10	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Diagonal, rounded	Vertical, complex, pyramidal, amorphous	n/a
Line	Curving, continuous	Flowing, complex, irregular	n/a
Color	Tans, grays	Vivid, greens, tans, seasonal variation	n/a
Texture	Medium grain	Coarse grain, dense	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	n/a	n/a	Bold, vertical; complex geometric/triangular
Line	n/a	n/a	Vertical/diagonal, horizontal; concave (conductors)
Color	n/a	n/a	Dull gray, transparent
Texture	n/a	n/a	Repeating coarse to medium grain and density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	8/21/2013
BLM Field Office/National Forest:	Ashley National Forest
Resource Area:	
Activity (program):	500kV Transmission Project



View south from Avintaquin Campground, Utah

Strong contrast would result from the construction and operation of the proposed Project in an enclosed landscape setting viewed from the Avintaquin Campground within lands designated by the Ashley National Forest as a retention VQO. The proposed Project would cross steep terrain as it traverses Reservation Ridge between the Reservation Ridge Scenic Backway and extremely steep terrain south of this ridge. Disturbance associated with construction access and right-of-way vegetation clearing would be screened by topography and vegetation and therefore, disturbance to these features would not be visible from this KOP. The proposed structures would be seen from 0.4 mile away and would be skylined above the trees on one of the domed peaks common along Reservation Ridge. By relocating the proposed Project behind the domed peak visible in this photograph, through the application of selective mitigation measure #7, the dominance of the transmission structures would be reduced through partial to complete landscape screening afforded by this topographic feature.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	8/21/2013
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 11S	Location Sketch 
Key Observation Point # 328 Indian Canyon Scenic Byway (U.S. Highway 191)	Range: 10E	
VRM Class/VQO: n/a	Section: 12	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Diagonal, bold, rounded, level	Vertical, complex, pyramidal, amorphous	n/a
Line	Curving, continuous, angular, horizontal	Flowing, complex, irregular	n/a
Color	Tans, grays	Vivid, greens, tans, seasonal variation, grays	n/a
Texture	Medium to coarse grain	Coarse, dense	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Bold, vertical; complex geometric/triangular
Line	Geometric, curvilinear	Angular, butt edge	Vertical/diagonal; thin concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	8/21/2013
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View south from U.S. Highway 191, Utah

Moderate/strong contrast would result from the construction and operation of the proposed Project in a panoramic landscape setting as viewed from U.S. Highway 191 (designated as both the Dinosaur Diamond Scenic Byway and Indian Canyon Scenic Byway). The proposed Project would traverse steep terrain located between Reservation and Argyle ridges as it crosses this designated scenic road. Disturbance associated with the construction of access road and vegetation clearing in the right-of-way would be mostly screened by vegetation except for views perpendicular to U.S. Highway 191 toward the east, which is not the common viewing direction along the highway. In this area, these disturbances would introduce geometric forms and curvilinear lines incongruent with the existing landscape character. The proposed structures would be seen at approximately 0.2 mile from a level viewer position and would introduce a strong level of structure contrast. To reduce contrast on views to the east, selective mitigation measure #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would be applied.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	8/21/2013
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 7S	Location Sketch 
Key Observation Point # 329 Reservation Ridge Scenic Backway	Range: 8W	
VRM Class/VQO: III	Section: 9	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Diagonal, rounded, undulating	Vertical, complex, pyramidal, amorphous	n/a
Line	Curving, continuous	Flowing, complex, irregular	n/a
Color	Tans, grays	Vivid, variety of green, white, tans, seasonal variation, grays	n/a
Texture	Medium to coarse grain	Dense, fine (understory) to coarse (overstory) grain	n/a

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Bold, vertical; complex geometric/triangular
Line	Curvilinear, geometric	Angular, bold, butt edge	Vertical/diagonal; thin concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

No

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	8/21/2013
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



View southwest from the Reservation Ridge Scenic Backway, Utah

Strong contrast would result from the construction and operation of the proposed Project within a panoramic landscape setting designated as VRM Class III. The proposed Project would cross rolling to steep terrain and would likely include a skylined structure on the intermediate ridge visible in the photograph. Disturbance associated with the construction of access roads would introduce additional curvilinear lines into the existing landscape with tower pads generating flat, geometric forms. Vegetation clearing in the right-of-way would produce geometric forms inconsistent with the existing amorphous vegetation patterns. The proposed structures would be seen at approximately 0.3 mile paralleling the Reservation Ridge Scenic Backway with structures intermittently skylined on ridges. Selective mitigation measures #3 (minimize ground disturbance) and #4 (minimize vegetation clearing) would reduce contrast on views from this scenic road.

VISUAL CONTRAST RATING WORKSHEET

DRAFT

Date:	8/21/2013
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project

Project Name: Energy Gateway South Transmission Project	Location: Township: 11S	Location Sketch 
Key Observation Point # 330 Dispersed residences north of Emma Park	Range: 10E	
VRM Class/VQO: n/a	Section: 23	

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Bold, rounded, level ridgetops and valley	Vertical, complex, pyramidal, amorphous	Low, geometric
Line	Curving, continuous, diagonal, horizontal	Flowing, complex, bands, irregular	Angular, vertical
Color	Tans, grays	Vivid green, tans, seasonal variation	Browns, black
Texture	Fine (valley) to coarse (mountain) grain	Coarse, even on slopes and scattered on ridges, stippled	Medium grain, sparse density

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Level, horizontal	Geometric, rectangular	Bold, vertical; complex geometric/triangular
Line	Geometric, curvilinear	Angular, butt edge	Vertical/diagonal; thin concave (conductors)
Color	Tans	Tans, gray-green	Dull gray, transparent
Texture	Fine grain	Fine to medium grain	Uniform coarse grain, medium density

Degree of Contrast

		Features											
		Landform/ Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form												
	Line												
	Color												
	Texture												

Does project design meet visual resource management objectives?

n/a

Additional mitigating measures recommended?

Yes

Evaluator(s):

EPG visual personnel

VISUAL CONTRAST RATING WORKSHEET

Date:	8/21/2013
BLM Field Office/National Forest:	Vernal Field Office
Resource Area:	
Activity (program):	500kV Transmission Project



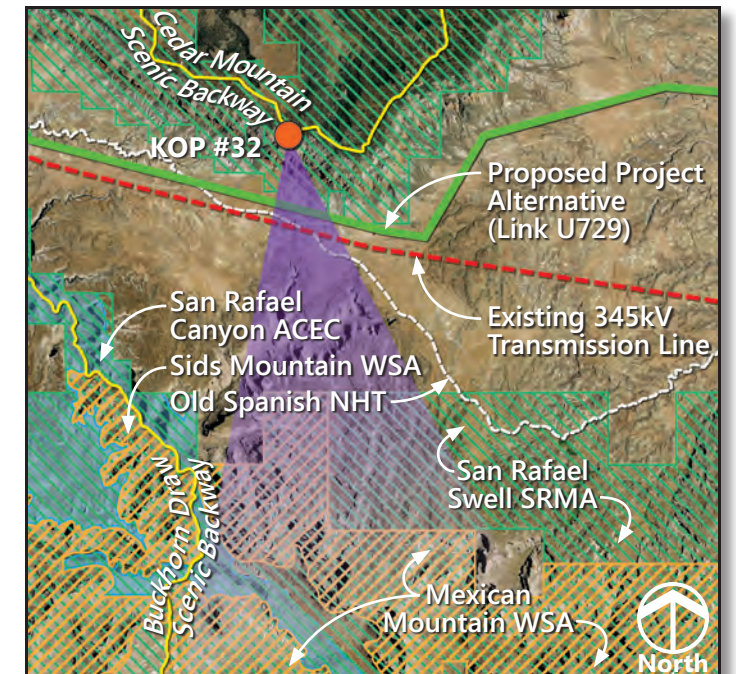
View southeast from an area of cabin development east of U.S. Highway 191, Utah

Strong contrast would result from the construction and operation of the proposed Project within this partially enclosed landscape setting associated with an area of cabin development east of U.S. Highway 191 along a tributary of Willow Creek. The proposed Project crosses level to rolling terrain adjacent to this tributary where due to the proximity of the Project, produces an inferior viewing position therefore skylining structures above the viewer. Disturbance associated with construction access would include building a series spur roads from existing roads to tower pads introducing additional curvilinear lines and geometric tower pads through associated earthwork efforts. Areas of right-of-way vegetation clearing would introduce geometric vegetation patterns, in particular to the east of the existing cabin, incongruent with the existing landscape character. The proposed structures would be seen immediately adjacent to this viewpoint, the entrance to this cabin development, in addition to paralleling this road for approximately 0.75 mile. This viewpoint, only 200 feet from the proposed centerline, was selected to describe the effect of the Project being located adjacent to residential areas where views would be completely dominated by the Project. Due to the proximity of the Project to these residences, including additional residences to the south, and limited opportunities to relocate the Project due to steep terrain to the north, minimizing these impacts through selective mitigation would be mostly associated with reducing the effects of right-of-way vegetation clearing through the application of selective mitigation measure #4.

Exhibit H3 – Visual Simulations



Existing Condition – View looking south from the Cedar Mountain Overlook toward the San Rafael Swell, Buckhorn Flat, and the Old Spanish NHT with an existing 345kV transmission line crossing BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 1.0 mile.



Simulated Condition – View of Alternative COUT BAX-B



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #32a – Cedar Mountain Overlook

DRAFT

February 2014

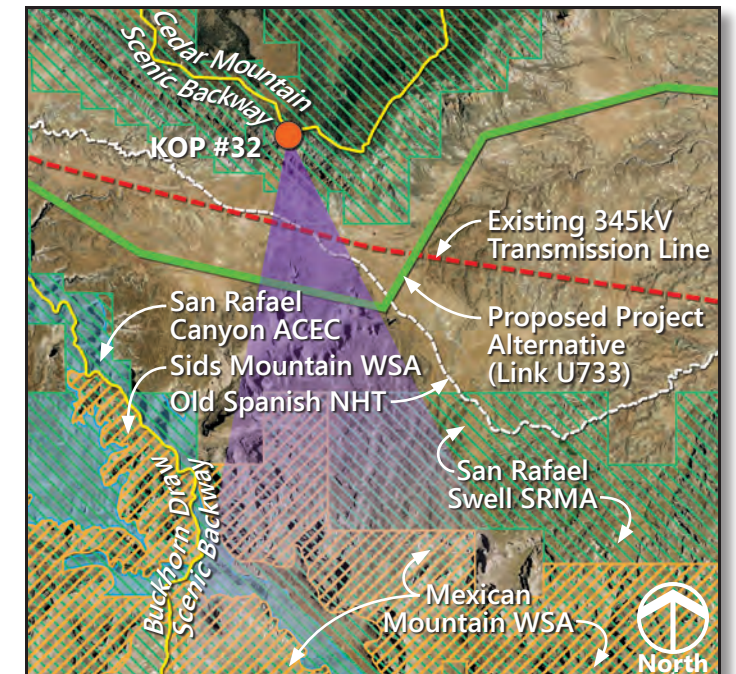
Page H3-1

Photo Date and Time: July 26, 2012, 8:25 a.m. Focal Length: 50mm

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking south from the Cedar Mountain Overlook toward the San Rafael Swell, Buckhorn Flat, and the Old Spanish NHT with an existing 345kV transmission line crossing BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 2.2 miles.



Simulated Condition – View of Alternative COUT BAX-C



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #32b – Cedar Mountain Overlook

DRAFT

February 2014

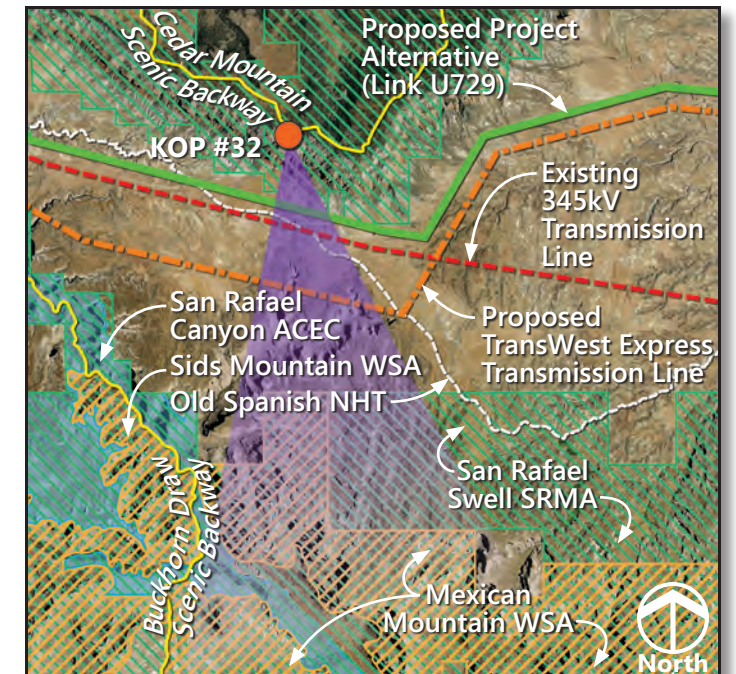
Page H3-2

Photo Date and Time: July 26, 2012, 8:25 a.m. Focal Length: 50mm

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking south from the Cedar Mountain Overlook toward the San Rafael Swell, Buckhorn Flat, and the Old Spanish NHT with an existing 345kV transmission line crossing BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 1.0 mile.



Simulated Condition – View of Alternative COUT BAX-B and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #32a – Cedar Mountain Overlook Cumulative Effects

DRAFT

February 2014

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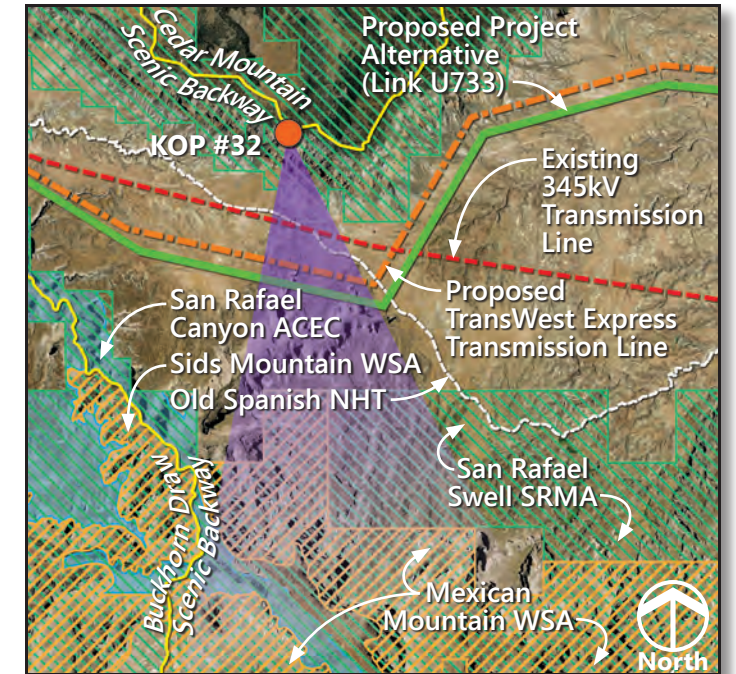
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Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



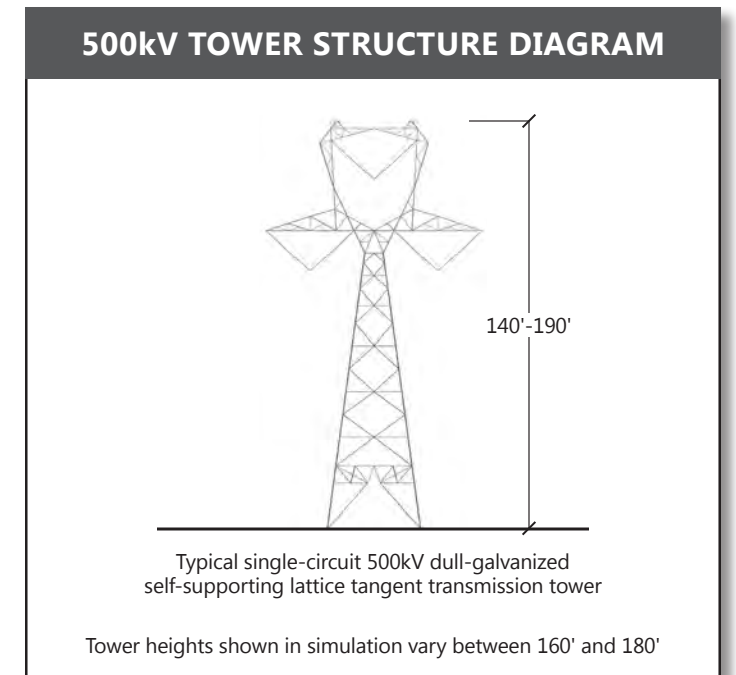
Existing Condition – View looking south from the Cedar Mountain Overlook toward the San Rafael Swell, Buckhorn Flat, and the Old Spanish NHT with an existing 345kV transmission line crossing BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 2.2 miles.



Simulated Condition – View of Alternative COUT BAX-C and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #32b – Cedar Mountain Overlook
Cumulative Effects

DRAFT

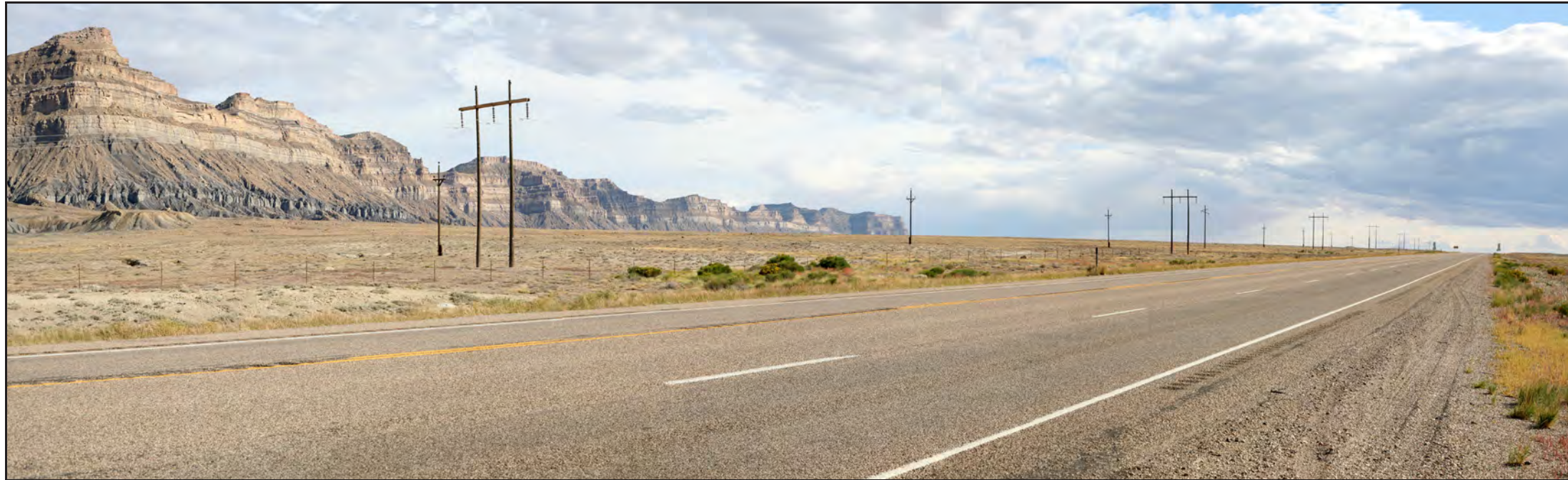
February 2014

Page H3-4

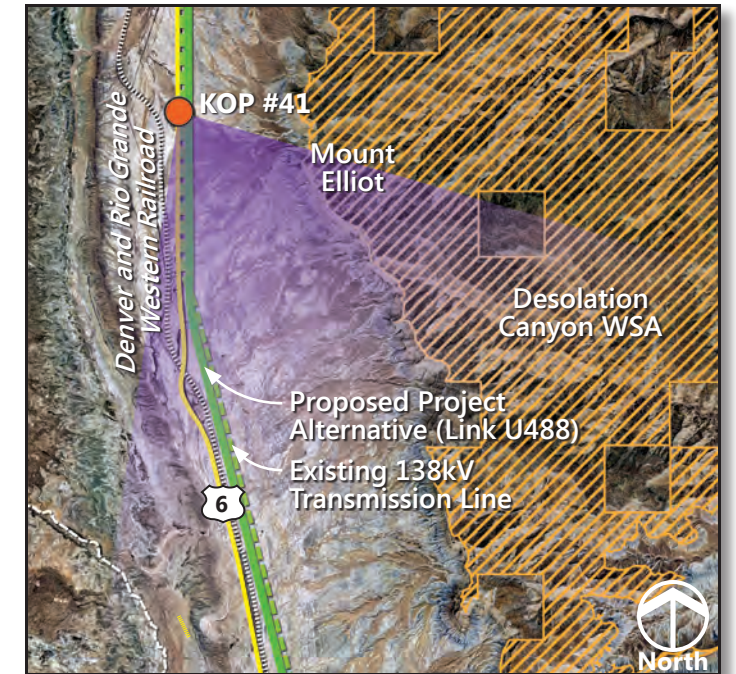
Photo Date and Time: July 26, 2012, 8:25 a.m. Focal Length: 50mm

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



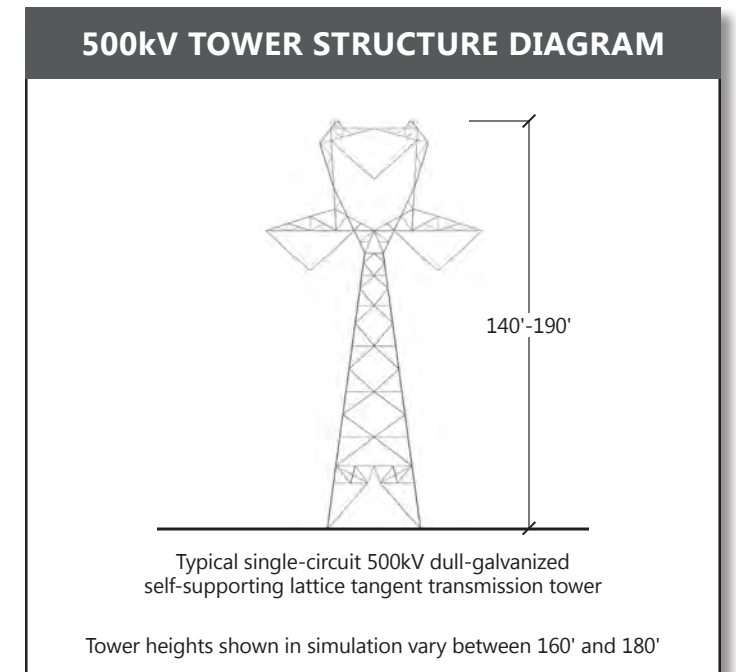
Existing Condition – View looking southeast from the Dinosaur Diamond Scenic Byway (U.S. Highway 6) at the intersection of the Green River Cutoff Road toward Mount Elliot and the Book Cliffs



View Location: The proposed transmission line would be located adjacent to the photo location.



Simulated Condition – View of Alternatives COUT BAX-C and COUT BAX-E



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #41 – Dinosaur Diamond Scenic Byway (US 6)

Photo Date and Time: October 4, 2011, 4:03 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 59-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

DRAFT

February 2014

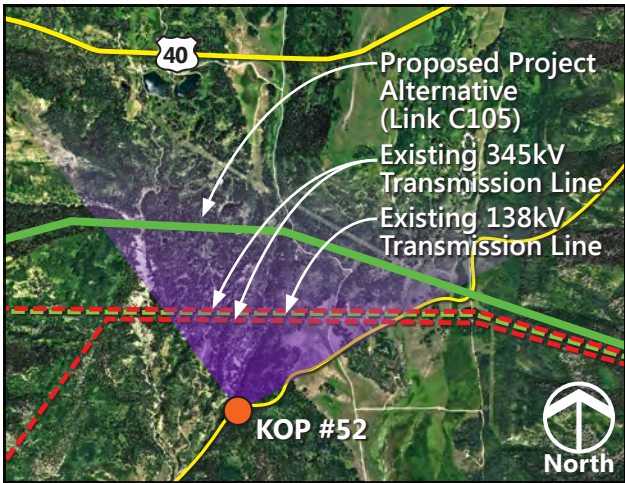
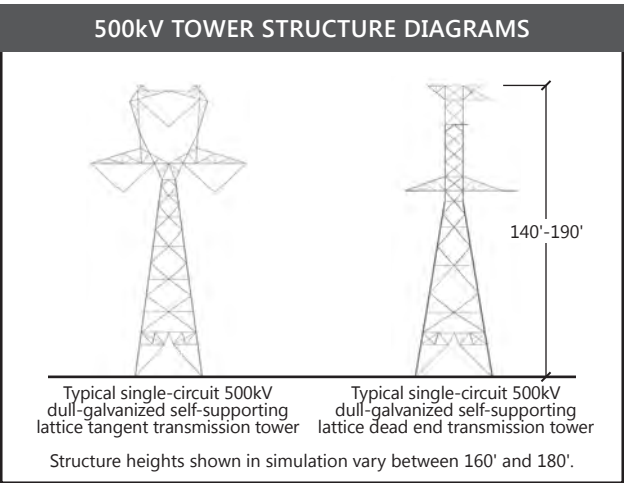
Page H3-5



Existing Condition – View looking northeast from residences southwest of Craig, Colorado



Simulated Condition – View of Alternative WYCO-D (and route variation)¹



View Location:
Approximate distance to proposed transmission line from photo location is 1.1 miles.

¹Note: This view is in vicinity of Series Compensation Station Siting Area D – Bell Rock. Based on the final location, this facility may be visible and result in stronger visual contrast from this viewpoint.

Photo Date and Time: September 27, 2011, 9:05 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 100-degree field of view)

**Draft EIS and LUPAs for the
Energy Gateway South Transmission Project**

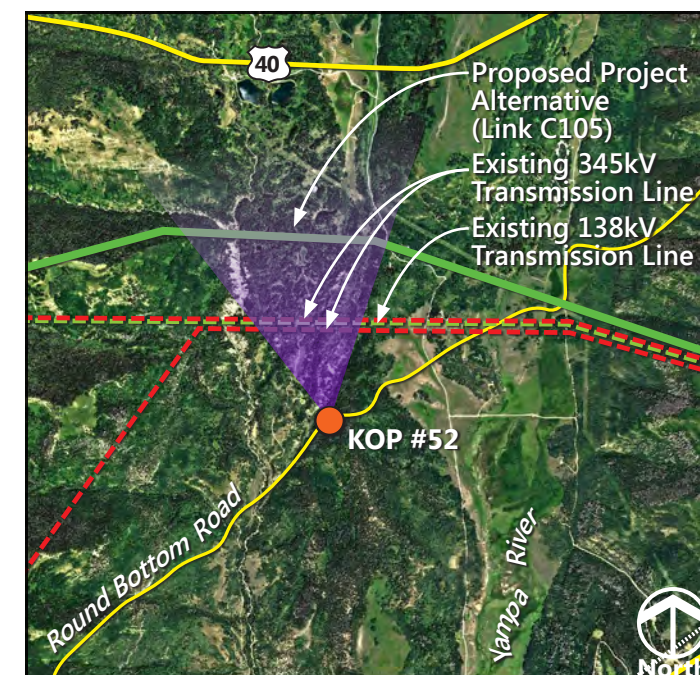
**KOP #52 – Dispersed Residences
southwest of Craig**

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

DRAFT



Existing Condition – View looking northeast from residences southwest of Craig, Colorado



View Location: Approximate distance of proposed transmission line from photo location is 1.1 miles.



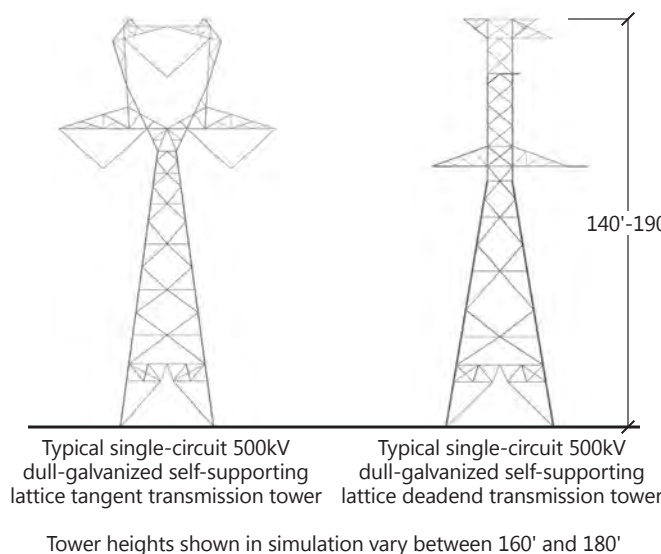
Simulated Condition – View of Alternative WYCO-D (and route variation)¹

¹Note: This view is in vicinity of Series Compensation Station Siting Area D – Bell Rock. Based on the final location, this facility may be visible and result in stronger visual contrast from this viewpoint.

Photo Date and Time: September 27, 2011, 9:05 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 44-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

500kV TOWER STRUCTURE DIAGRAMS



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #52 – Dispersed Residences southwest of Craig ~View A~

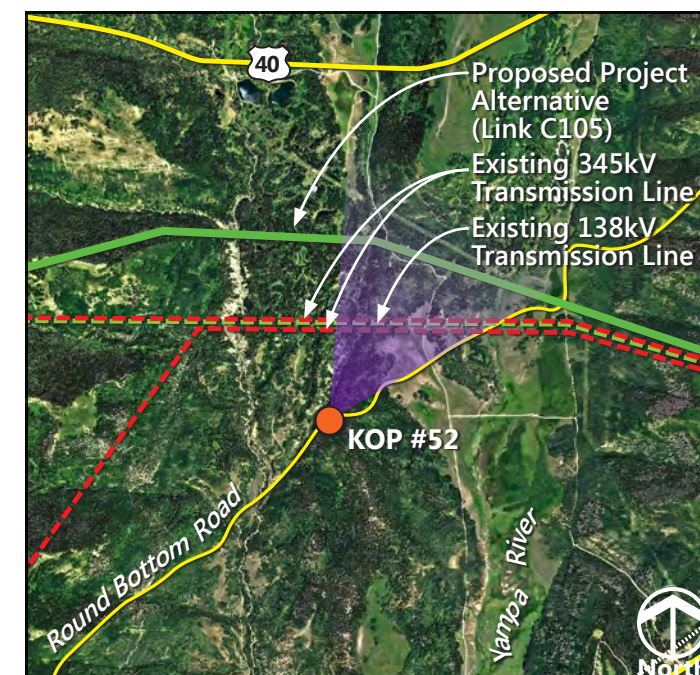
DRAFT

February 2014

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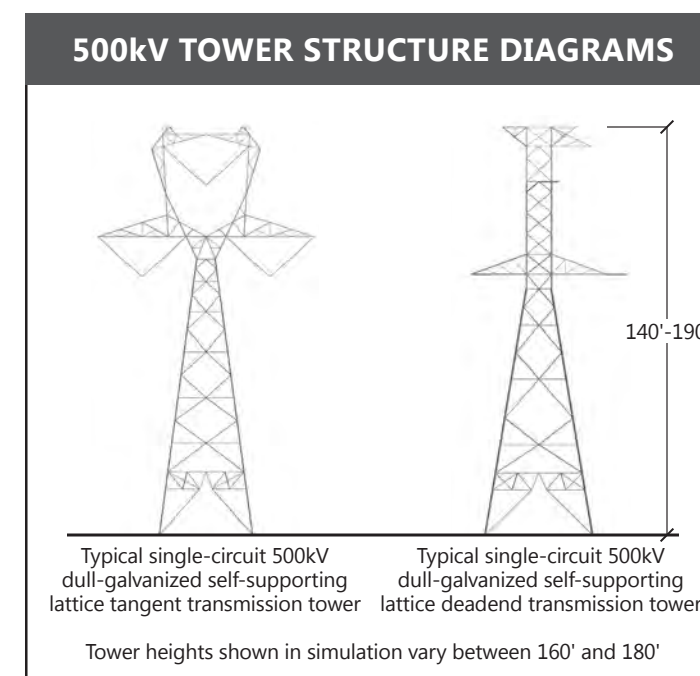
Existing Condition – View looking northeast from residences southwest of Craig, Colorado



View Location: Approximate distance of proposed transmission line from photo location is 1.1 miles.



Simulated Condition – View of Alternative WYCO-D (and route variation)¹



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KOP #52 – Dispersed Residences southwest of Craig ~View B~

¹Note: This view is in vicinity of Series Compensation Station Siting Area D – Bell Rock. Based on the final location, this facility may be visible and result in stronger visual contrast from this viewpoint.

Photo Date and Time: September 27, 2011, 9:05 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 54-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

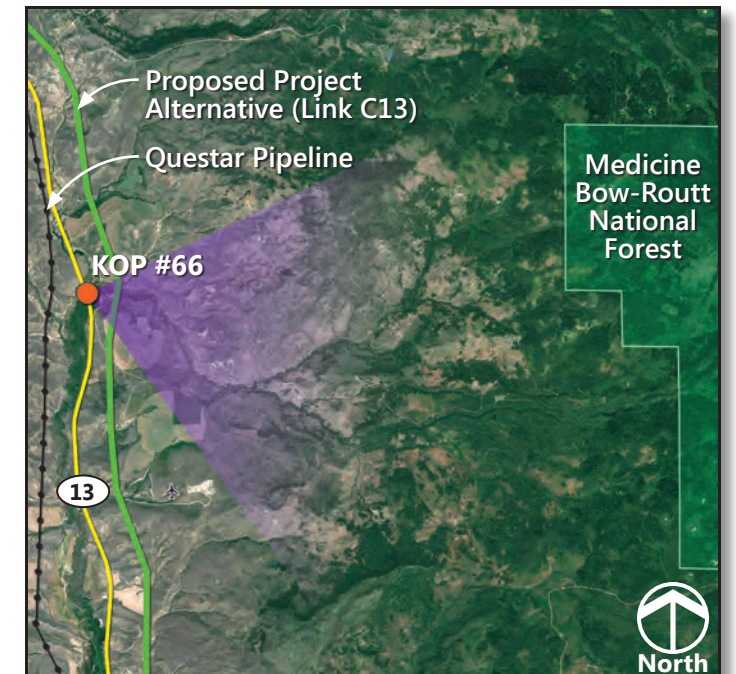
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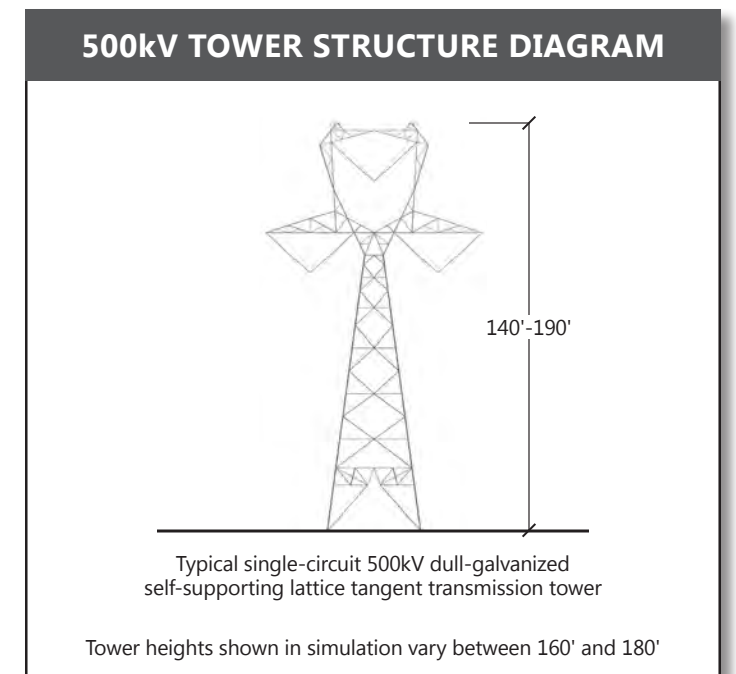
Existing Condition – View looking east from residences adjacent to Colorado State Highway 13, approximately 20 miles north of Craig



View Location: Approximate distance to proposed transmission line from photo location is 0.3 mile.



Simulated Condition – View of Alternative WYCO-D (and route variation)



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #66 – Dispersed Residences along Colorado State Highway 13

Photo Date and Time: September 27, 2011, 2:14 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 73-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

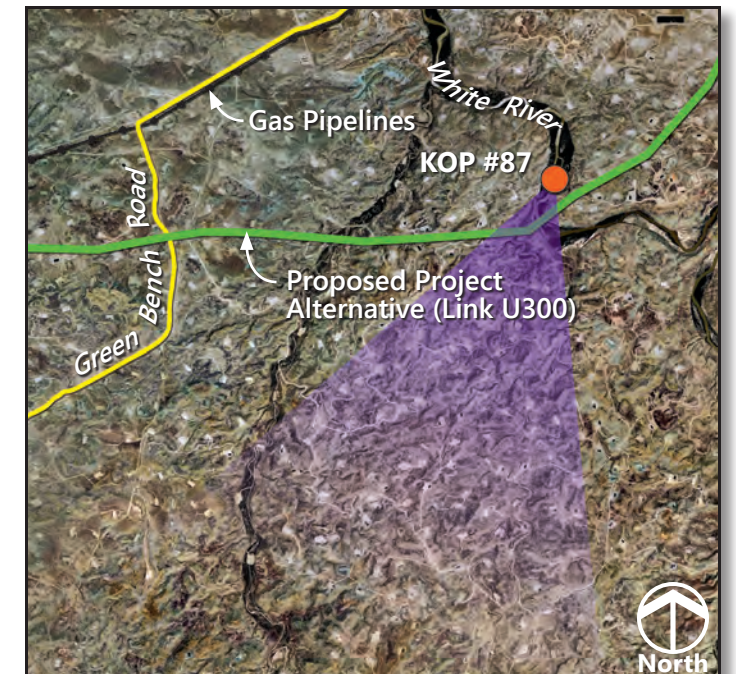
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Existing Condition – View looking south from the Enron Recreation Area on the White River toward BLM VRM Class III lands

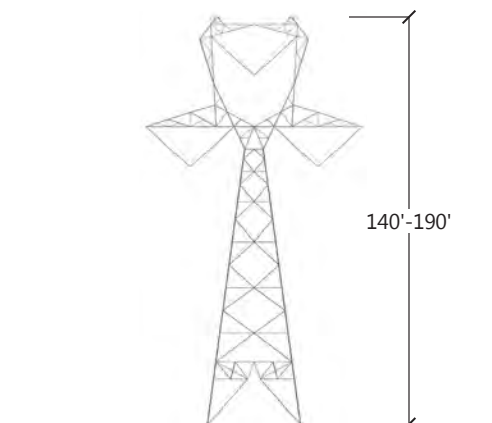


View Location: Approximate distance to proposed transmission line from photo location is 0.2 mile.



Simulated Condition – View of Alternatives COUT-C (and route variations), COUT-H, and COUT-I

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

**KOP #87 – Enron Recreation Area
(on White River)**

Photo Date and Time: July 25, 2012, 10:10 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 54-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

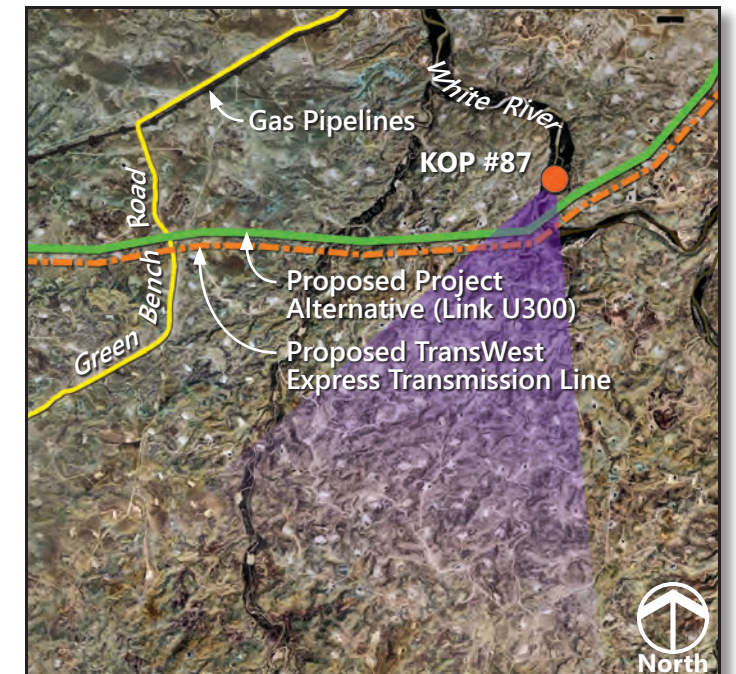
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Existing Condition – View looking south from the Enron Recreation Area on the White River toward BLM VRM Class III lands

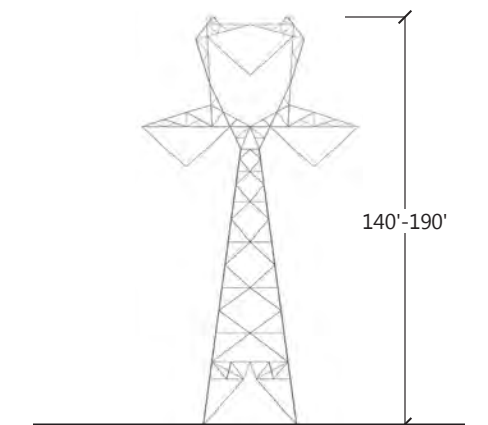


View Location: Approximate distance to proposed transmission line from photo location is 0.2 mile.



Simulated Condition – View of Alternatives COUT-C (and route variations), COUT-H, and COUT-I, and the proposed TransWest Express transmission line

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

**KOP #87 – Enron Recreation Area
(on White River)
Cumulative Effects**

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Photo Date and Time: July 25, 2012, 10:10 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 54-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking south from dispersed residences south of Roosevelt, Utah.



View Location: Approximate distance to proposed transmission line from photo location is 0.2 mile.



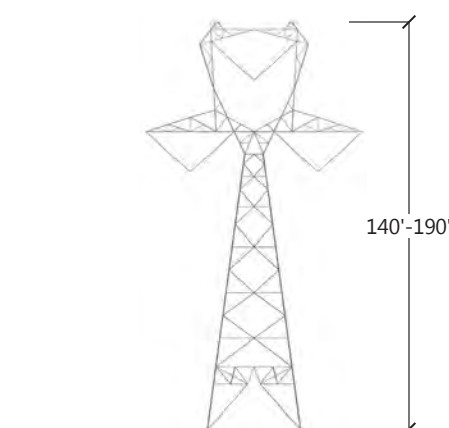
Simulated Condition – View of Alternatives COUT-A (and route variation) and COUT-B (and route variations)¹

¹Note: This view is in vicinity of Series Compensation Station Siting Area F – Roosevelt. Based on the final location, this facility may be visible and result in stronger visual contrast from this viewpoint.

Photo Date and Time: July 25, 2012, 12:53 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 72-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #109 – Dispersed Residences south of Roosevelt

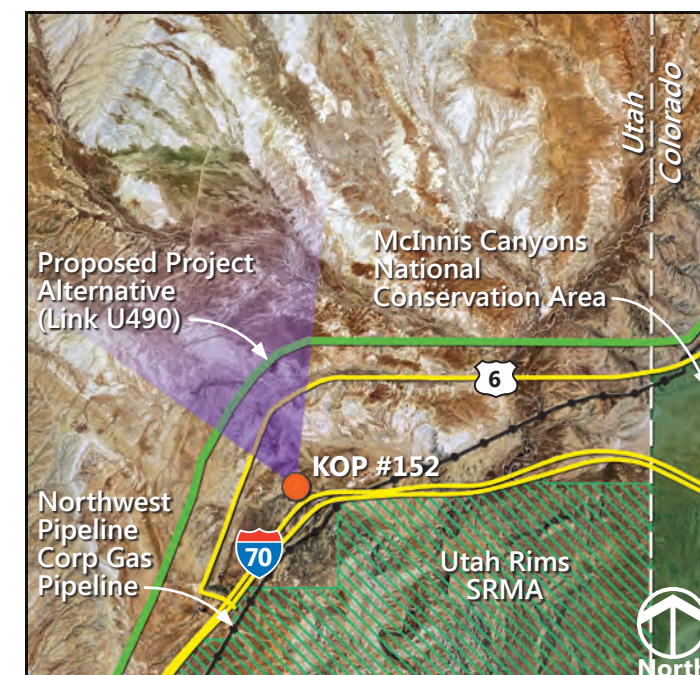
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Existing Condition – View looking northwest from the Harley Dome Rest Area Overlook adjacent to the Dinosaur Diamond Scenic Byway (Interstate 70) toward BLM VRM Class III lands

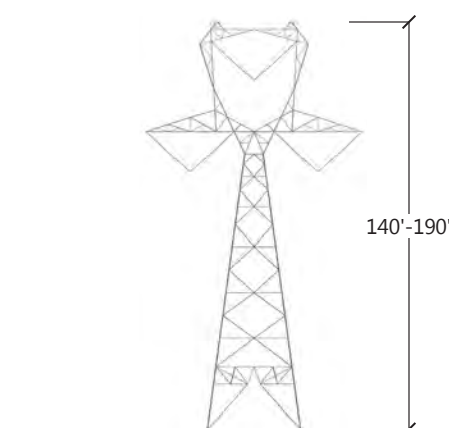


View Location: Approximate distance to proposed transmission line from photo location is 1.3 miles.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #152 – Interstate 70 Harley Dome Overlook (Dinosaur Diamond Scenic Byway)

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Photo Date and Time: October 11, 2011, 3:31 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 61-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking northwest from the Harley Dome Rest Area Overlook adjacent to the Dinosaur Diamond Scenic Byway (Interstate 70) toward BLM VRM Class III lands

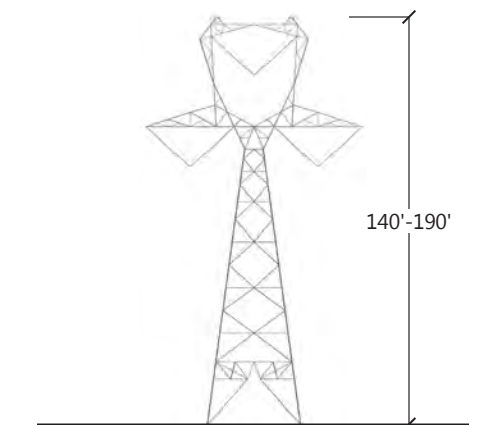


View Location: Approximate distance to proposed transmission line from photo location is 1.3 miles.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E, and the proposed TransWest Express transmission line

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #152 – Interstate 70 Harley Dome Overlook
(Dinosaur Diamond Scenic Byway)
Cumulative Effects

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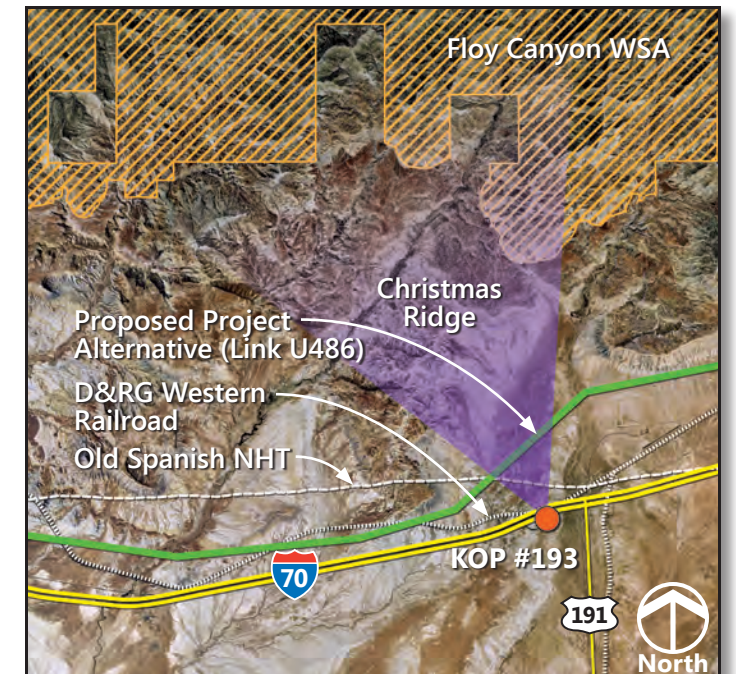
Photo Date and Time: October 11, 2011, 3:31 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 61-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking northwest from the Crescent Junction Rest Stop on I-70, part of the Dinosaur Diamond Scenic Byway, toward the Book Cliffs and BLM VRM Class III lands

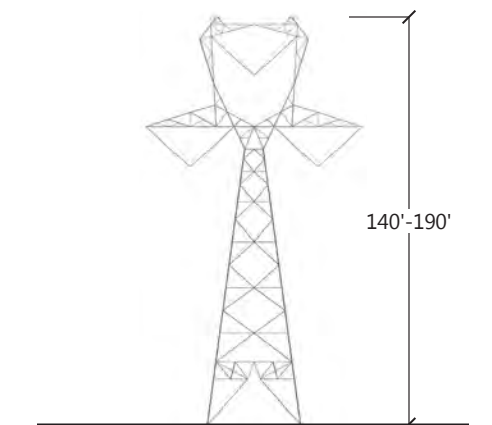


View Location: Approximate distance to proposed transmission line from photo location is 1.0 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #193 – I-70 Crescent Junction Rest Stop

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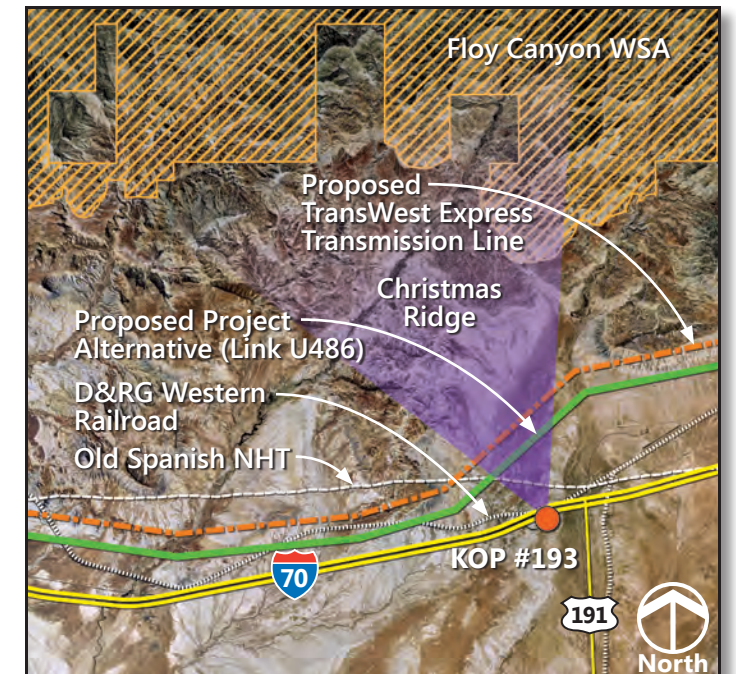
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Photo Date and Time: July 23, 2012, 2:06 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 42-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking northwest from the Crescent Junction Rest Stop on I-70, part of the Dinosaur Diamond Scenic byway, toward the Book Cliffs and BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 1.0 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #193 – I-70 Crescent Junction Rest Stop Cumulative Effects

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Photo Date and Time: July 23, 2012, 2:06 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 42-degree field of view)

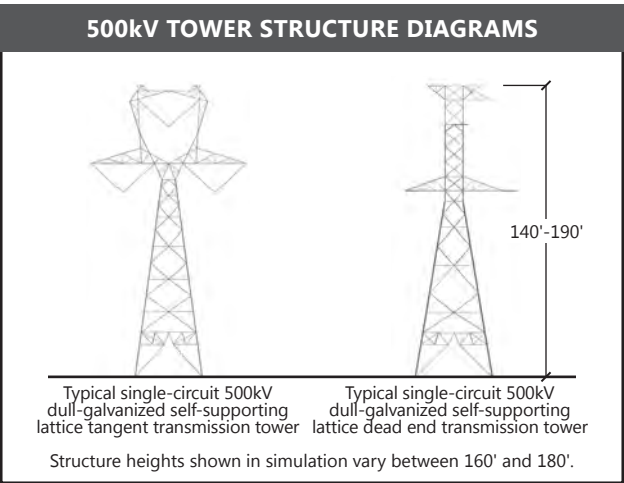
Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking southwest from Indian Creek Campground in the Manti-La Sal National Forest



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT-I



View Location:
Approximate distance to proposed transmission line from photo location is 0.3 mile.

Photo Date and Time: September 27, 2011, 11:56 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 135-degree field of view)

**Draft EIS and LUPAs for the
Energy Gateway South Transmission Project**

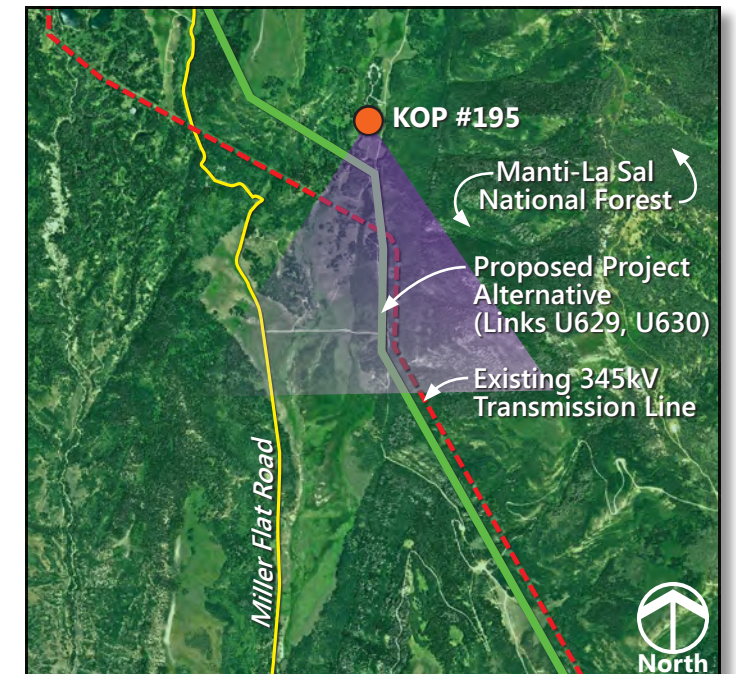
KOP #195 – Indian Creek Campground

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

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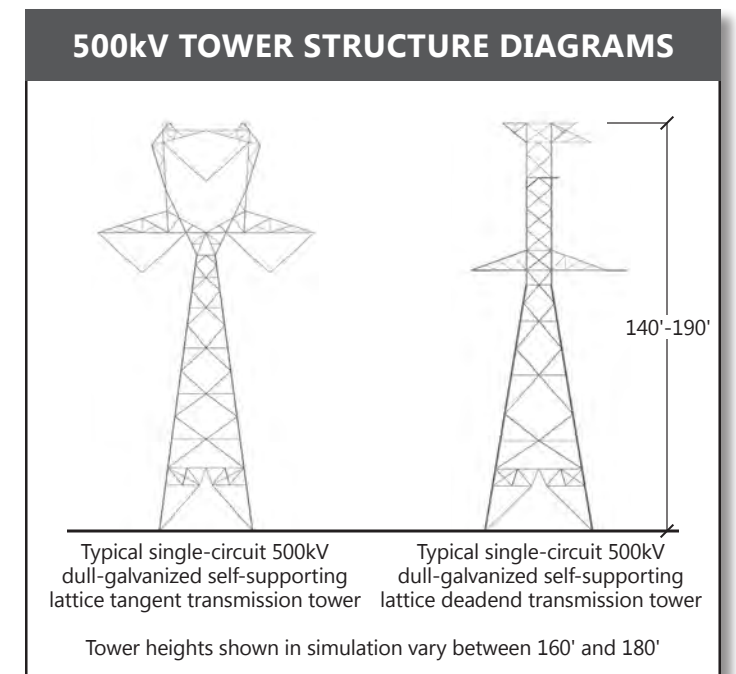
Existing Condition – View looking southwest from Indian Creek Campground in the Manti-La Sal National Forest



View Location: Approximate distance to proposed transmission line from photo location is 0.3 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT-I



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #195 – Indian Creek Campground
~View A~

Photo Date and Time: September 27, 2011, 11:56 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 78-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

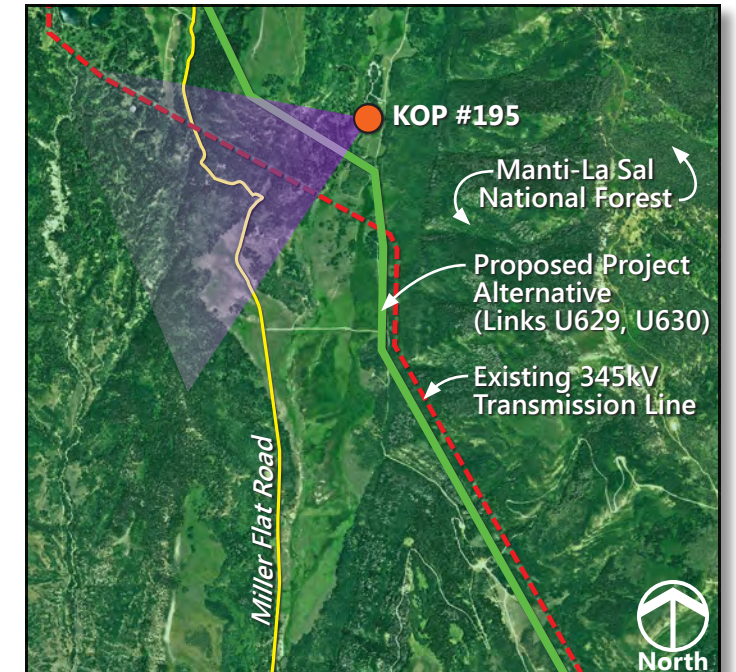
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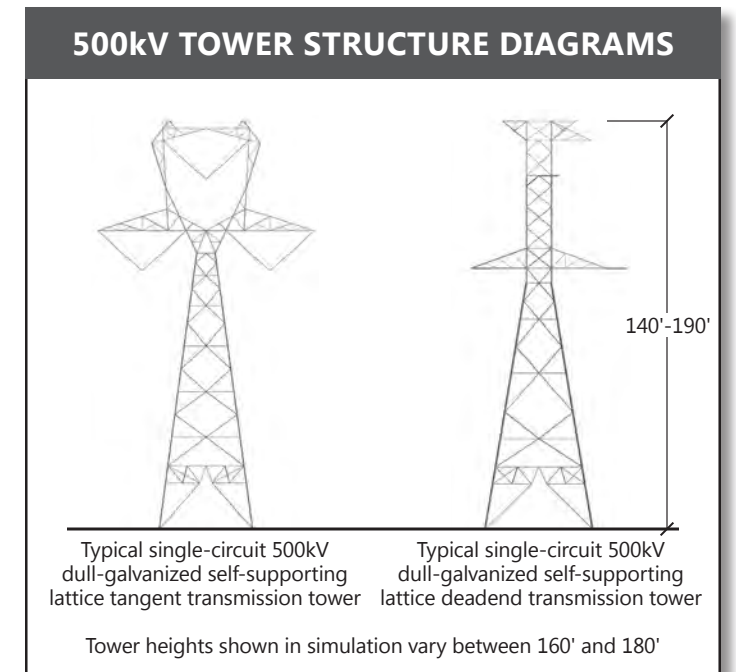
Existing Condition – View looking southwest from Indian Creek Campground in the Manti-La Sal National Forest



View Location: Approximate distance to proposed transmission line from photo location is 0.3 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT-I



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #195 – Indian Creek Campground
~View B~

Photo Date and Time: September 27, 2011, 11:56 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 78-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

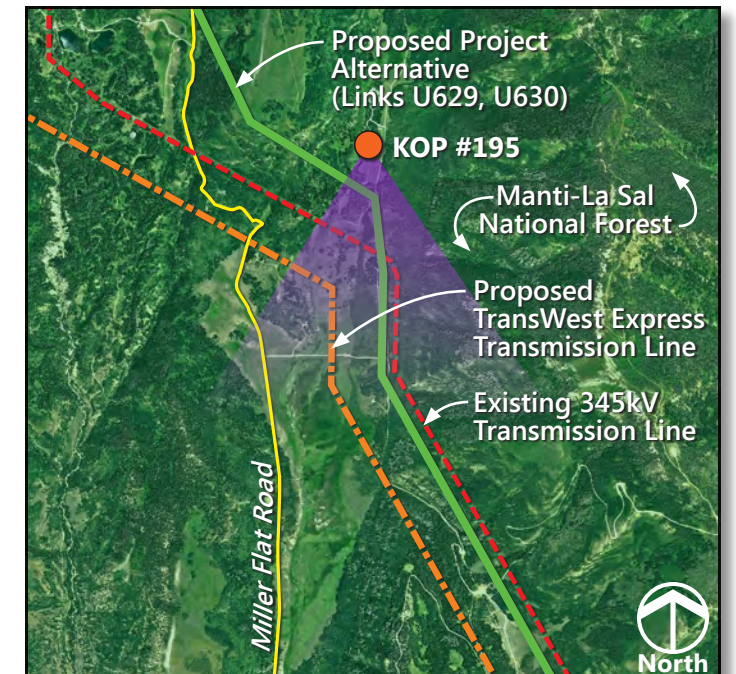
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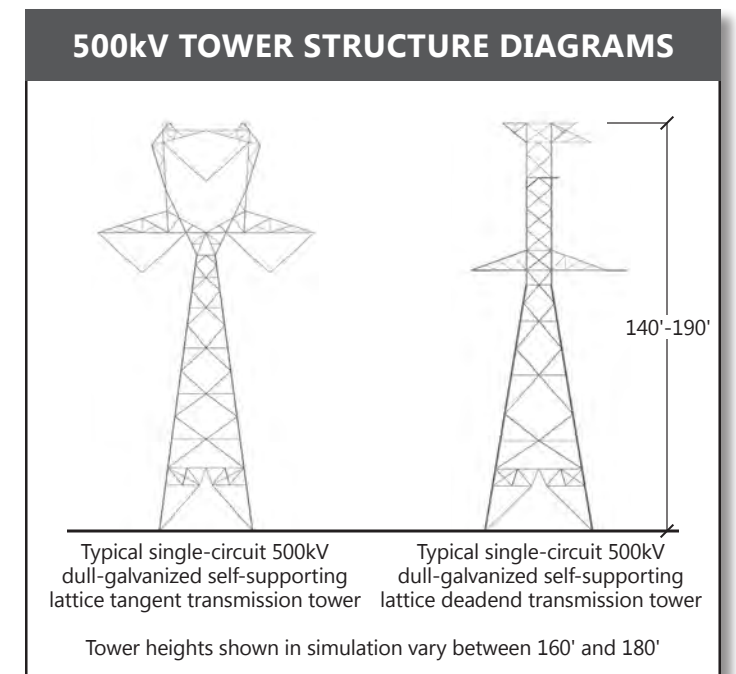
Existing Condition – View looking southwest from Indian Creek Campground in the Manti-La Sal National Forest



View Location: Approximate distance to proposed transmission line from photo location is 0.3 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT-I, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #195 – Indian Creek Campground
~View A~
Cumulative Effects

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Photo Date and Time: September 27, 2011, 11:56 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 78-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



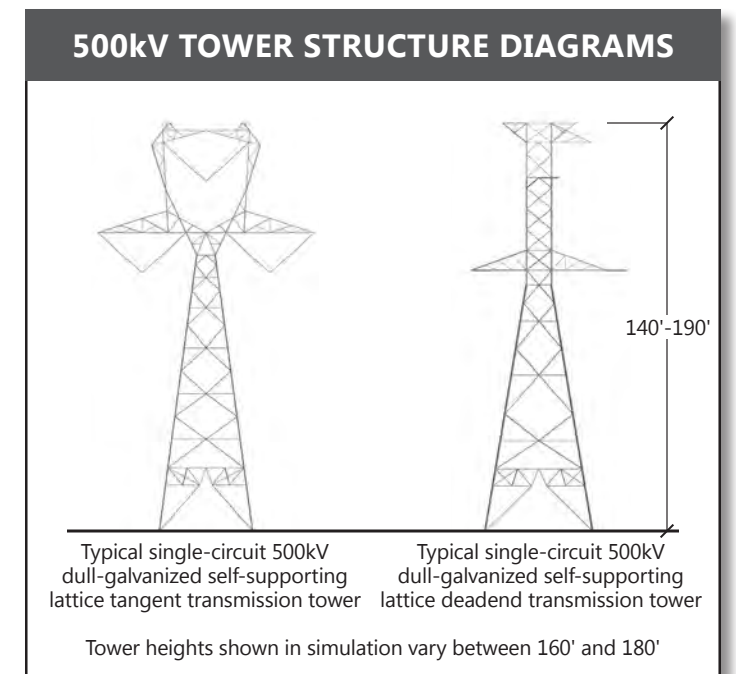
Existing Condition – View looking southwest from residences south of Hanna, Wyoming



View Location: Approximate distance to proposed transmission line from photo location is 0.4 mile.



Simulated Condition – View of Alternative WYCO-D (and route variation)



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #197 – Hanna Residential

Photo Date and Time: October 6, 2011, 9:01 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 50-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

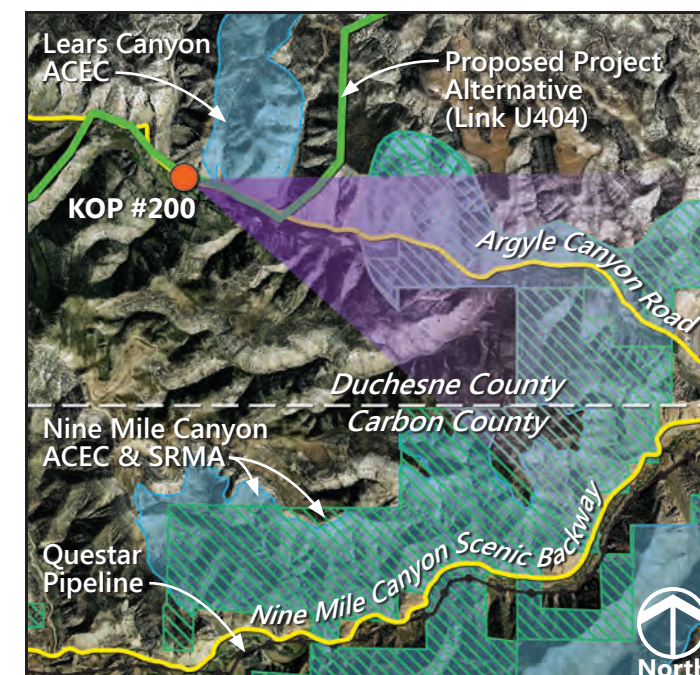
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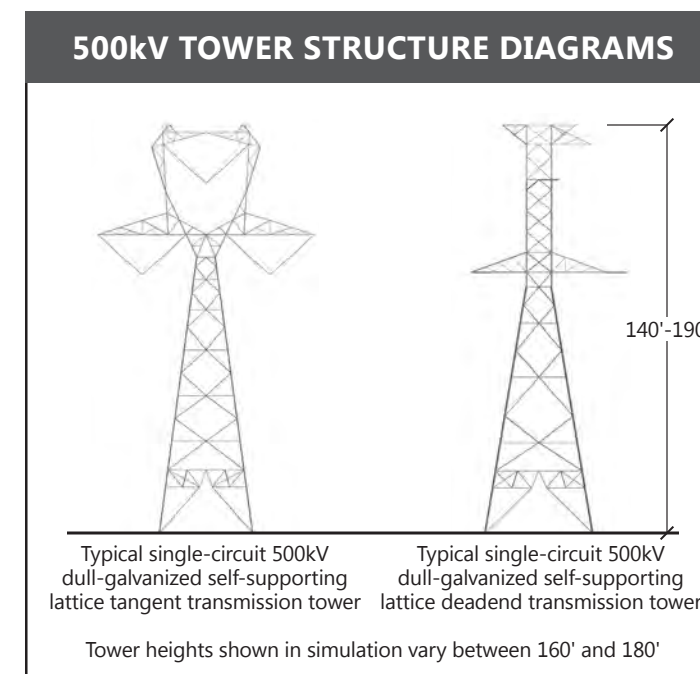
Existing Condition – View looking east from Argyle Canyon Road toward BLM VRM Class II and Class III lands



View Location: The proposed transmission line would be located adjacent to the photo location.



Simulated Condition – View of Alternatives COUT-C (and route variations), COUT-H, and COUT-I



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #200 – Argyle Canyon Road

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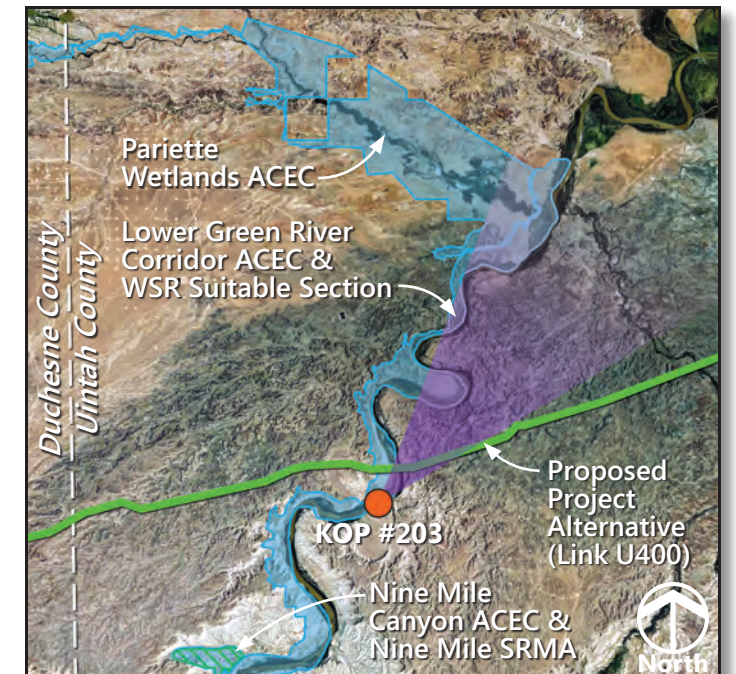
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Photo Date and Time: July 24, 2012, 3:45 p.m. Focal Length: 50mm

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking northeast from Fourmile Bottom in the Lower Green River Corridor ACEC toward BLM VRM Class II and Class IV lands



View Location: Approximate distance of proposed transmission line from photo location is 1.0 mile.



Simulated Condition – View of Alternatives COUT-C (and route variations), COUT-H and COUT-I



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #203 – Fourmile Bottom

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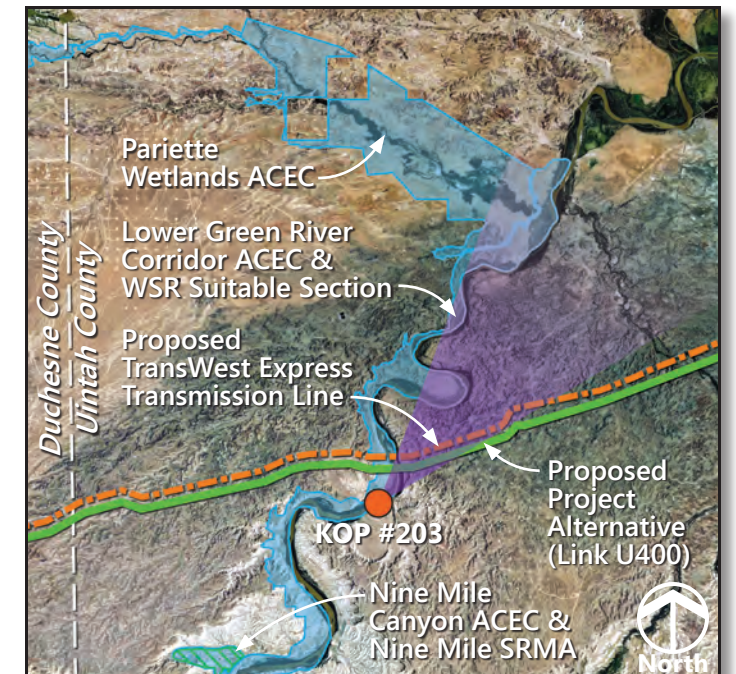
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Photo Date and Time: July 25, 2012, 2:09 p.m. Focal Length: 50mm

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking northeast from Fourmile Bottom in the Lower Green River Corridor ACEC toward BLM VRM Class II and Class IV lands



View Location: Approximate distance of proposed transmission line from photo location is 1.0 mile.



Simulated Condition – View of Alternatives COUT-C (and route variations), COUT-H, and COUT-I, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #203 – Fourmile Bottom Cumulative Effects

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Photo Date and Time: July 25, 2012, 2:09 p.m. Focal Length: 50mm

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking southwest from residences west of Helper, Utah, toward BLM VRM Class III lands

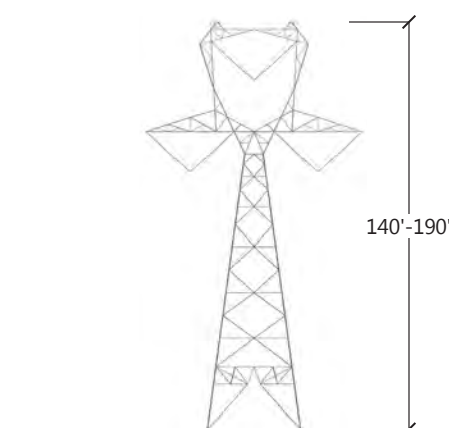


View Location: Approximate distance to proposed transmission line from photo location is 0.2 mile.



Simulated Condition – View of Alternative COUT-H

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #208 – West Helper Residences

Photo Date and Time: July 23, 2012, 1:44 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in an 80-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

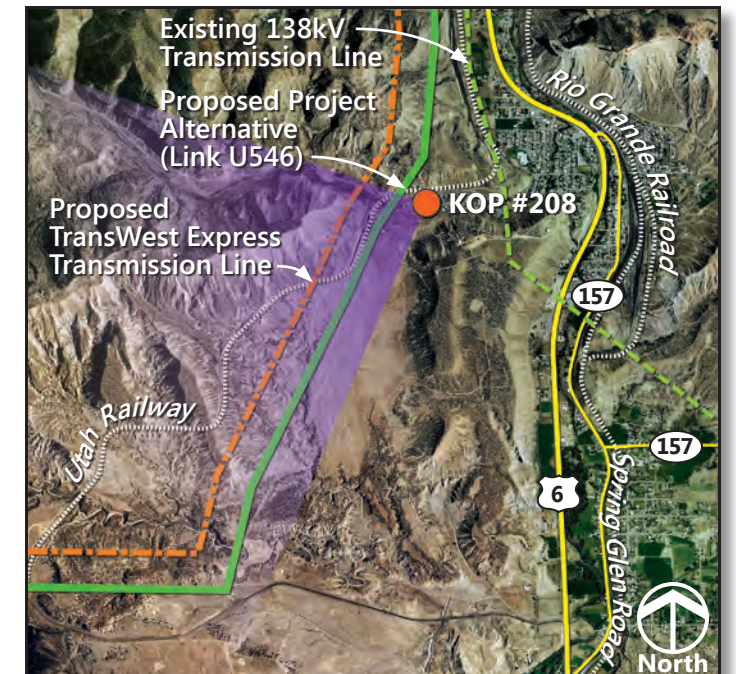
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Existing Condition – View looking southwest from residences west of Helper, Utah, toward BLM VRM Class III lands

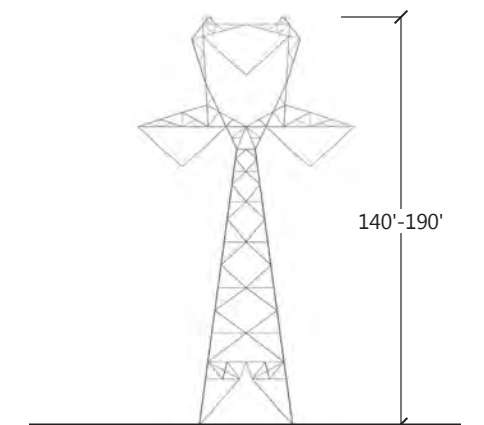


View Location: Approximate distance to proposed transmission line from photo location is 0.2 mile.



Simulated Condition – View of Alternative COUT-H and the proposed TransWest Express transmission line

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #208 – West Helper Residences Cumulative Effects

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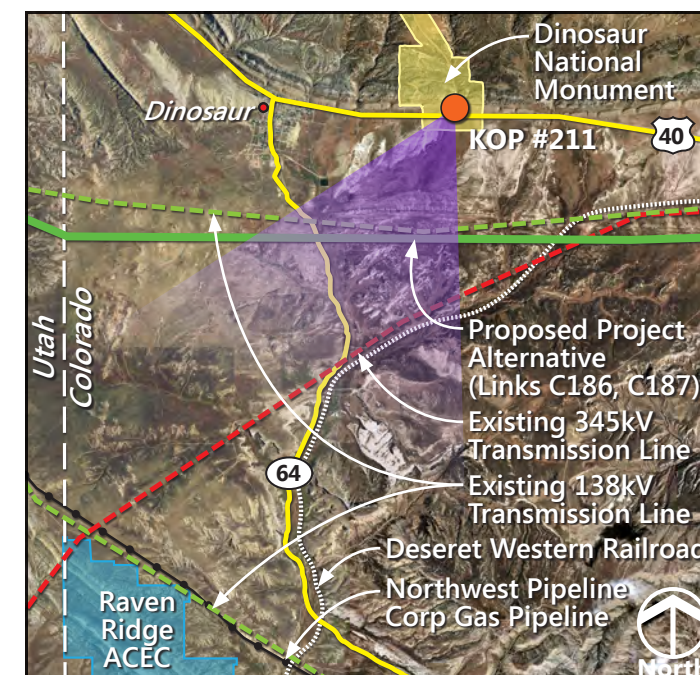
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Photo Date and Time: July 23, 2012, 1:44 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in an 80-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking southwest from the Dinosaur National Monument Visitor Center toward BLM VRM Class III lands

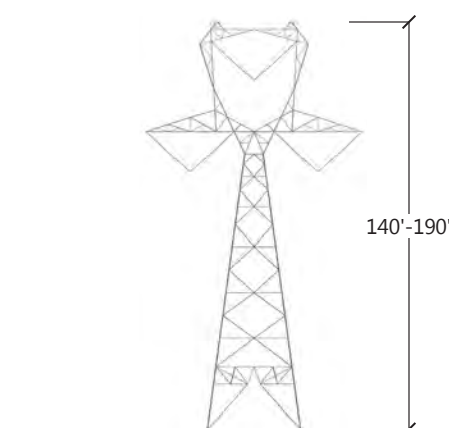


View Location: Approximate distance of proposed transmission line from photo location is 1.3 miles.



Simulated Condition – View of Alternatives COUT-A (and route variation) and COUT-B (and route variations)

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #211a – Dinosaur National Monument Visitor Center

Photo Date and Time: September 26, 2011, 4:39 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 58-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

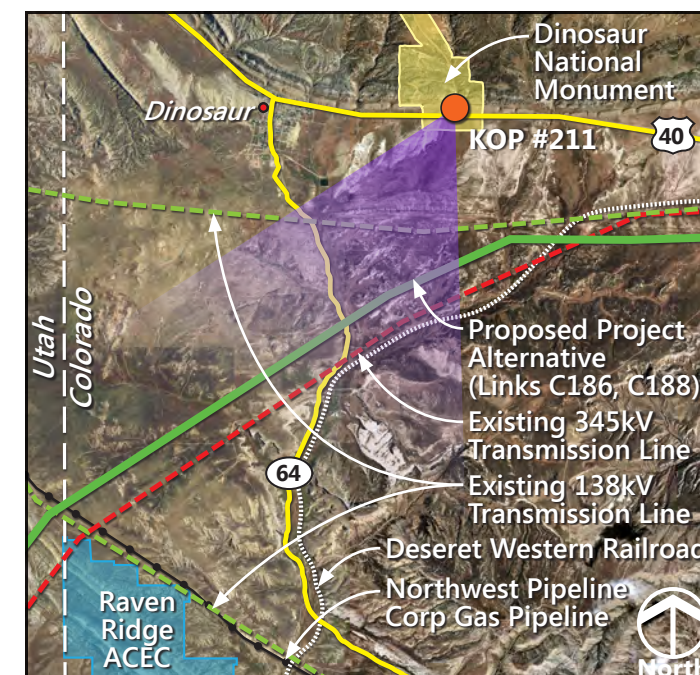
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Existing Condition – View looking southwest from the Dinosaur National Monument Visitor Center toward BLM VRM Class III lands

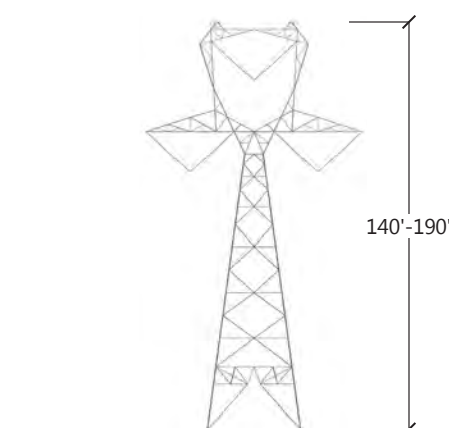


View Location: Approximate distance of proposed transmission line from photo location is 1.7 miles.



Simulated Condition – View of Alternatives COUT-C (and route variations), COUT-H, and COUT-I

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #211b – Dinosaur National Monument Visitor Center

Photo Date and Time: September 26, 2011, 4:39 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 58-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

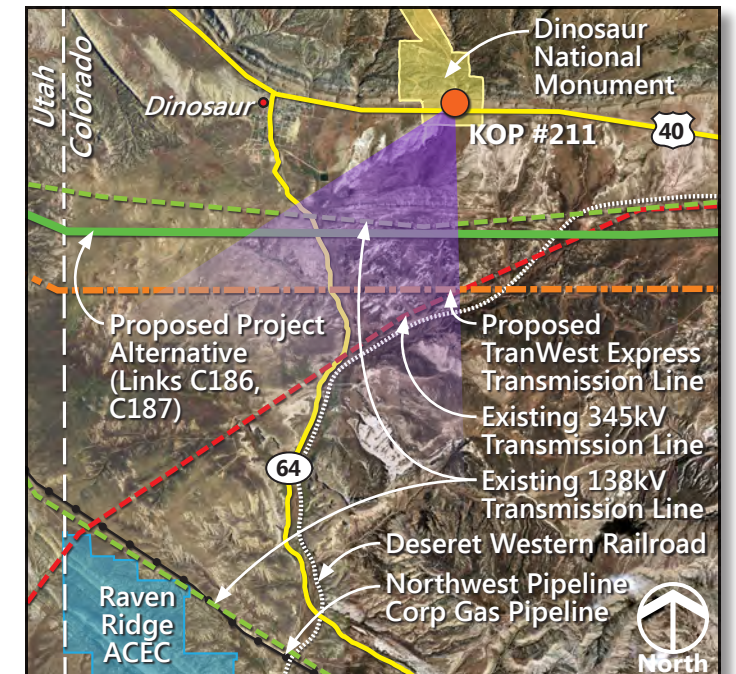
DRAFT

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Existing Condition – View looking southwest from the Dinosaur National Monument Visitor Center toward BLM VRM Class III lands

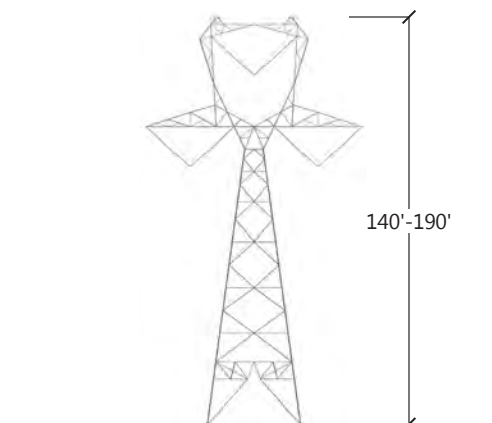


View Location: Approximate distance of proposed transmission line from photo location is 1.3 miles.



Simulated Condition – View of Alternatives COUT-A (and route variation) and COUT-B (and route variations), and the proposed TransWest Express transmission line

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #211a – Dinosaur National Monument Visitor Center Cumulative Effects

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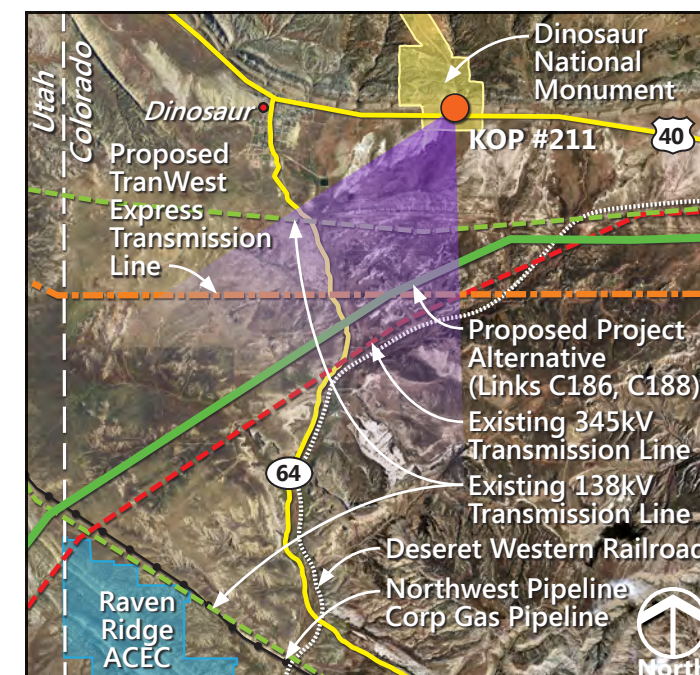
Page H3-29

Photo Date and Time: September 26, 2011, 4:39 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 53-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking southwest from the Dinosaur National Monument Visitor Center toward BLM VRM Class III lands

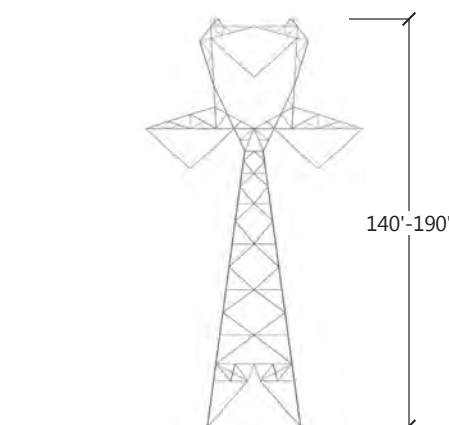


View Location: Approximate distance of proposed transmission line from photo location is 1.7 miles.



Simulated Condition – View of Alternatives COUT-C (and route variations), COUT-H, and COUT-I, and the proposed TransWest Express transmission line

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #211b – Dinosaur National Monument Visitor Center Cumulative Effects

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February 2014

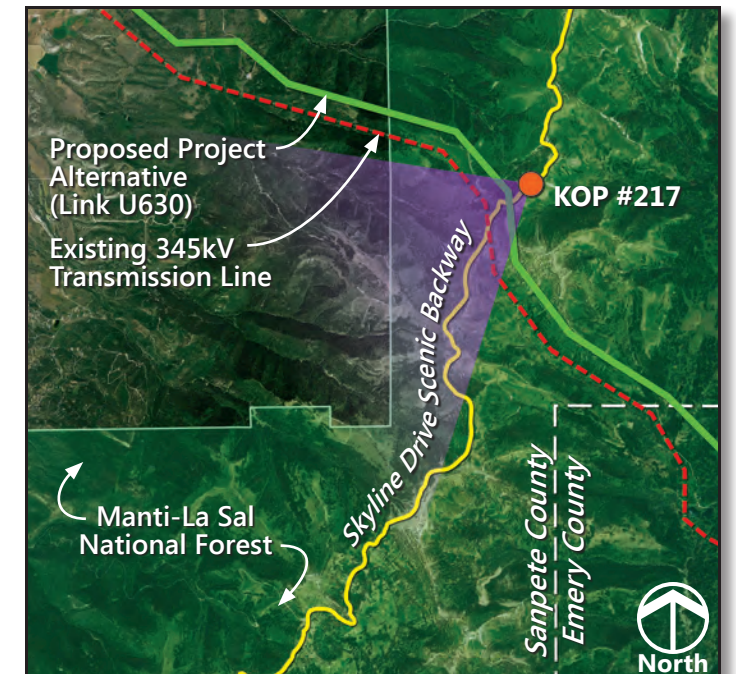
Page H3-30

Photo Date and Time: September 26, 2011, 4:39 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 53-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking southwest from the Skyline Drive Scenic Backway in the Manti-La Sal National Forest toward an existing 345kV transmission line (not visible)

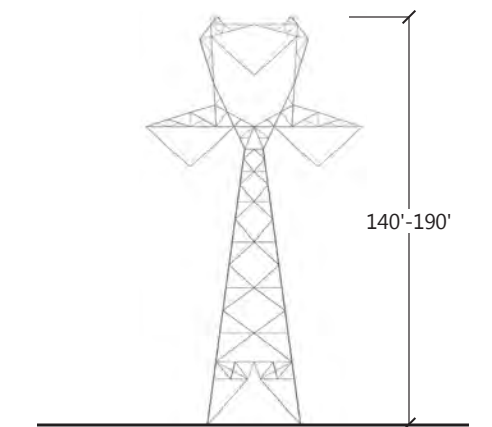


View Location: Approximate distance to proposed transmission line from photo location is 0.3 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT-I

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #217 – Skyline Drive Scenic Backway

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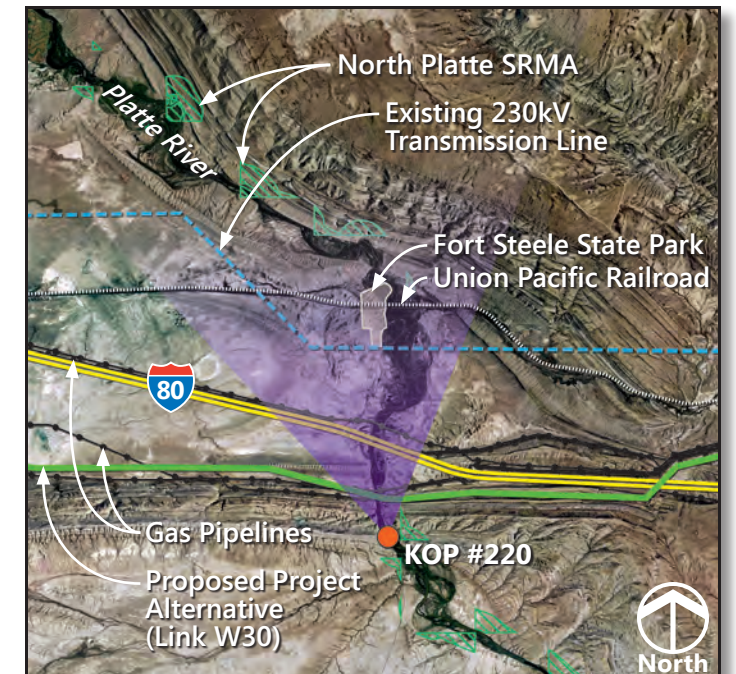
Page H3-31

Photo Date and Time: September 27, 2011, 10:02 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 82-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking north from Carbon County Road 347, adjacent to the North Platte SRMA, toward BLM VRM Class IV lands



View Location: Approximate distance to proposed transmission line from photo location is 0.5 mile.



Simulated Condition – View of Alternatives WYCO-B (and route variations), WYCO-C (and route variations), WYCO-D (and route variation), and WYCO-F (and route variations)



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #220 – North Platte River SRMA

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February 2014

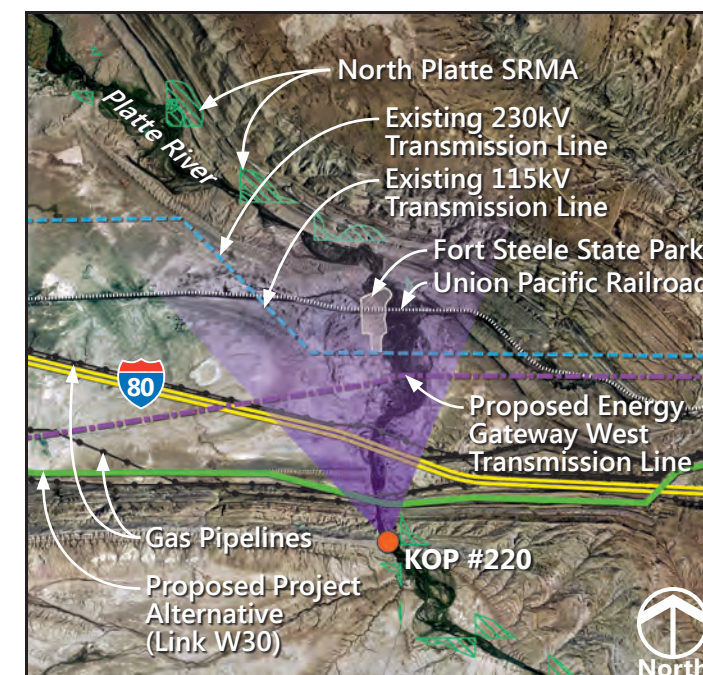
Page H3-32

Photo Date and Time: October 7, 2011, 10:09 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 65-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



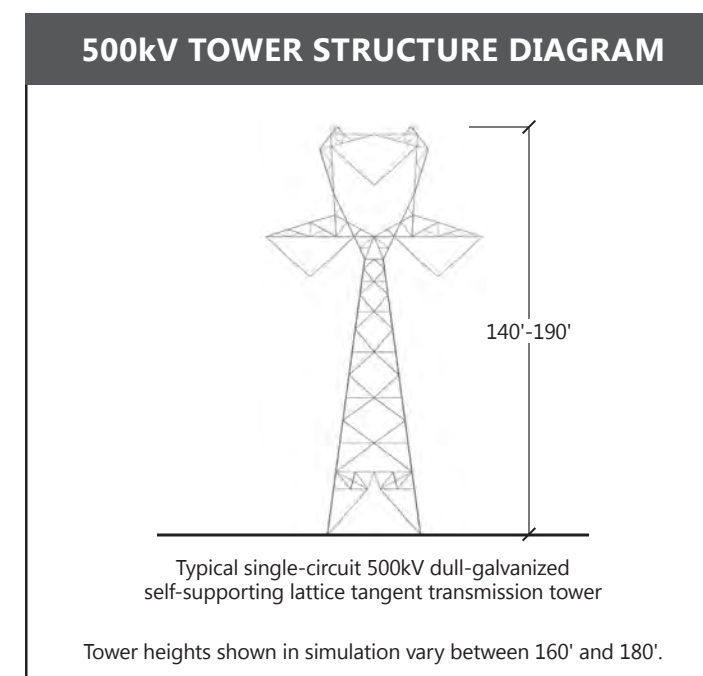
Existing Condition – View looking north from Carbon County Road 347, adjacent to the North Platte SRMA, toward BLM VRM Class IV lands



View Location: Approximate distance to proposed transmission line from photo location is 0.5 mile.



Simulated Condition – View of Alternatives WYCO-B (and route variations), WYCO-C (and route variations), WYCO-D (and route variation), and WYCO-F (and route variations), and the proposed Energy Gateway West transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #220 – North Platte River SRMA Cumulative Effects

DRAFT

February 2014

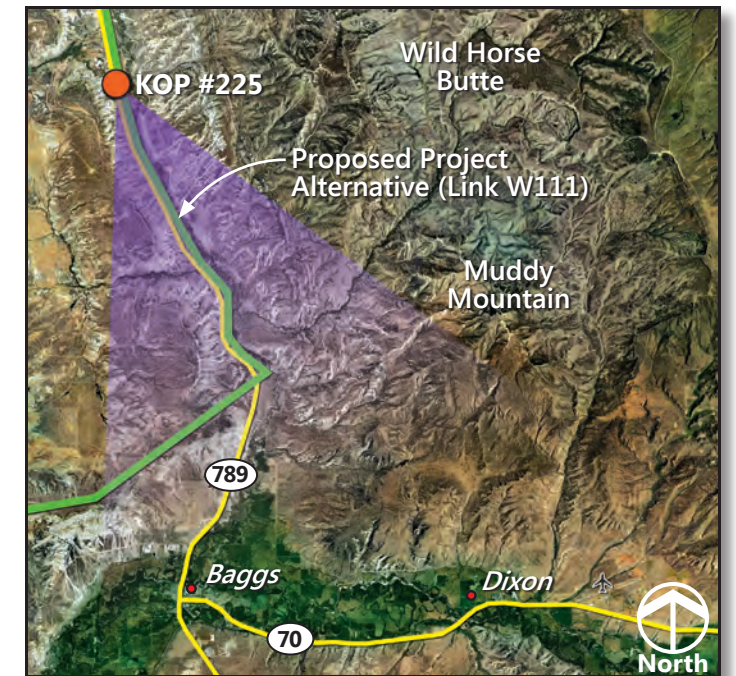
Page H3-33

Photo Date and Time: October 7, 2011, 10:09 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 65-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed Energy Gateway West project are conceptual and shown for reference only.



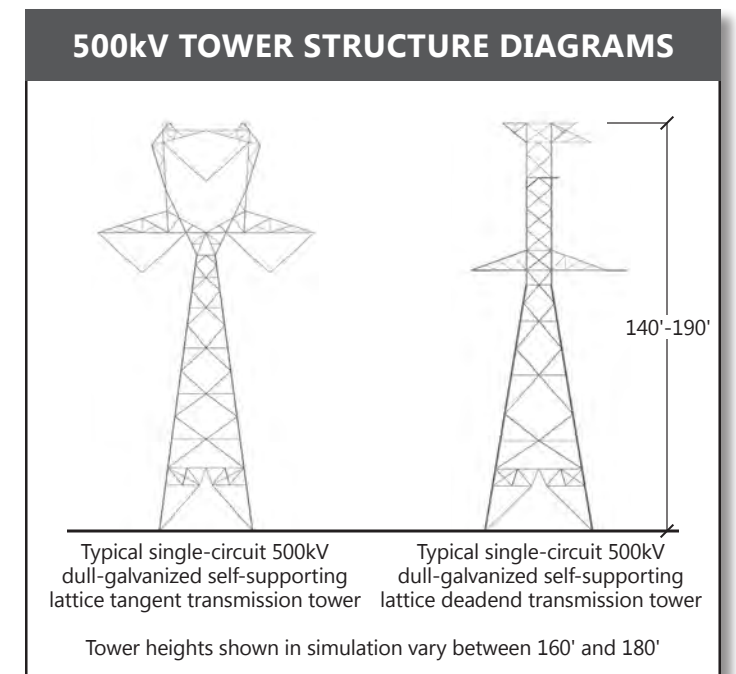
Existing Condition – View looking south from Wyoming Highway 789, north of Baggs, Wyoming, toward BLM VRM Class III lands



View Location: The proposed transmission line would be located adjacent to the photo location.



Simulated Condition – View of Alternative WYCO-D (and route variation)



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #225 – Outlaw Trail Loop Scenic Drive
(Wyoming Highway 789 North of Baggs)

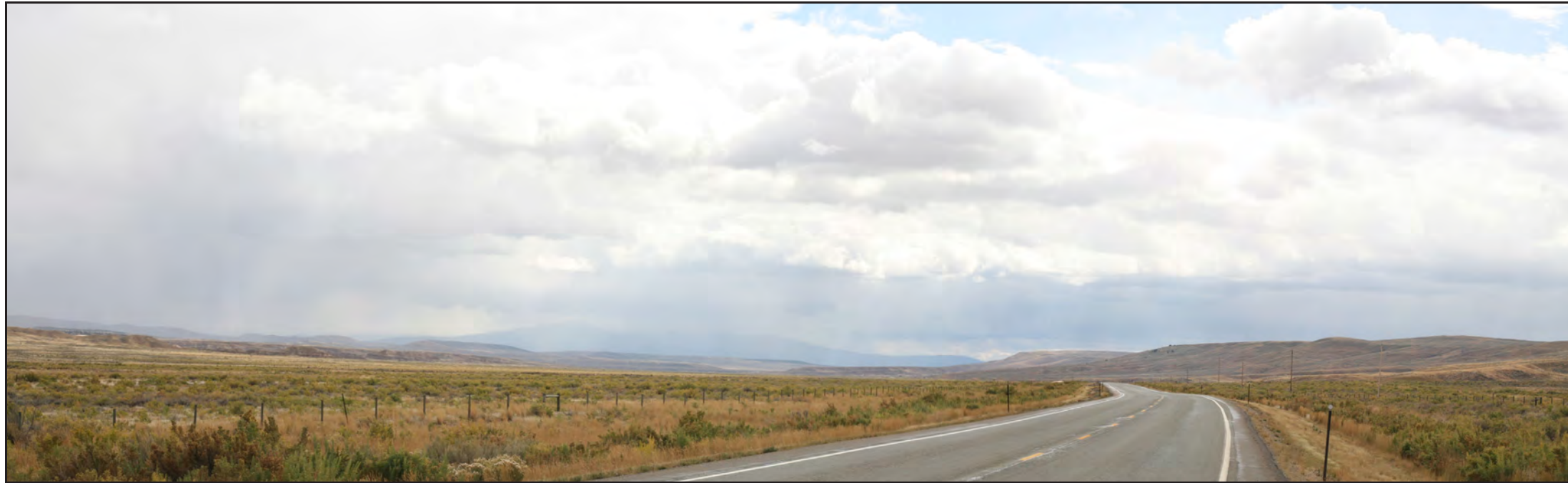
DRAFT

February 2014

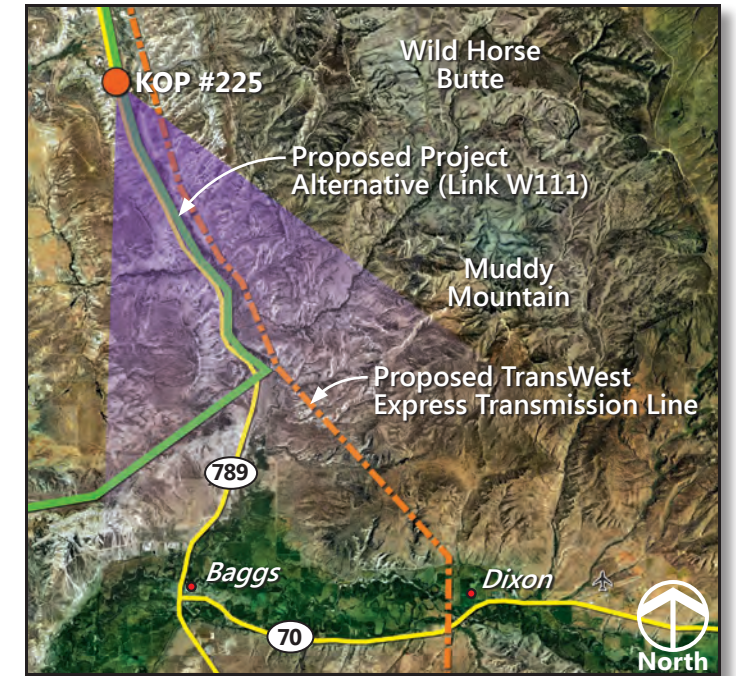
Page H3-34

Photo Date and Time: October 11, 2011, 1:16 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 50-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



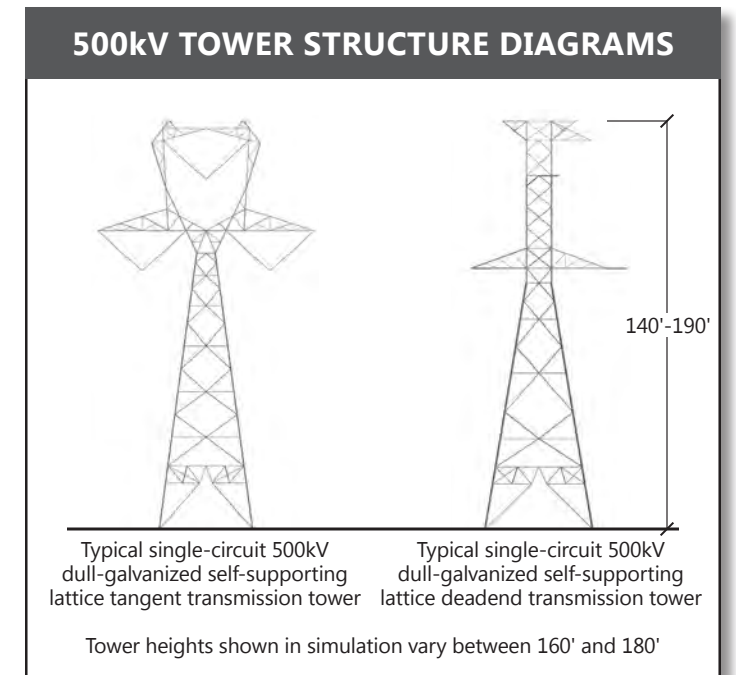
Existing Condition – View looking south from Wyoming Highway 789, north of Baggs, Wyoming, toward BLM VRM Class III lands



View Location: The proposed transmission line would be located adjacent to the photo location.



Simulated Condition – View of Alternative WYCO-D (and route variation) and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #225 – Outlaw Trail Loop Scenic Drive
(Wyoming Highway 789 North of Baggs)
Cumulative Effects

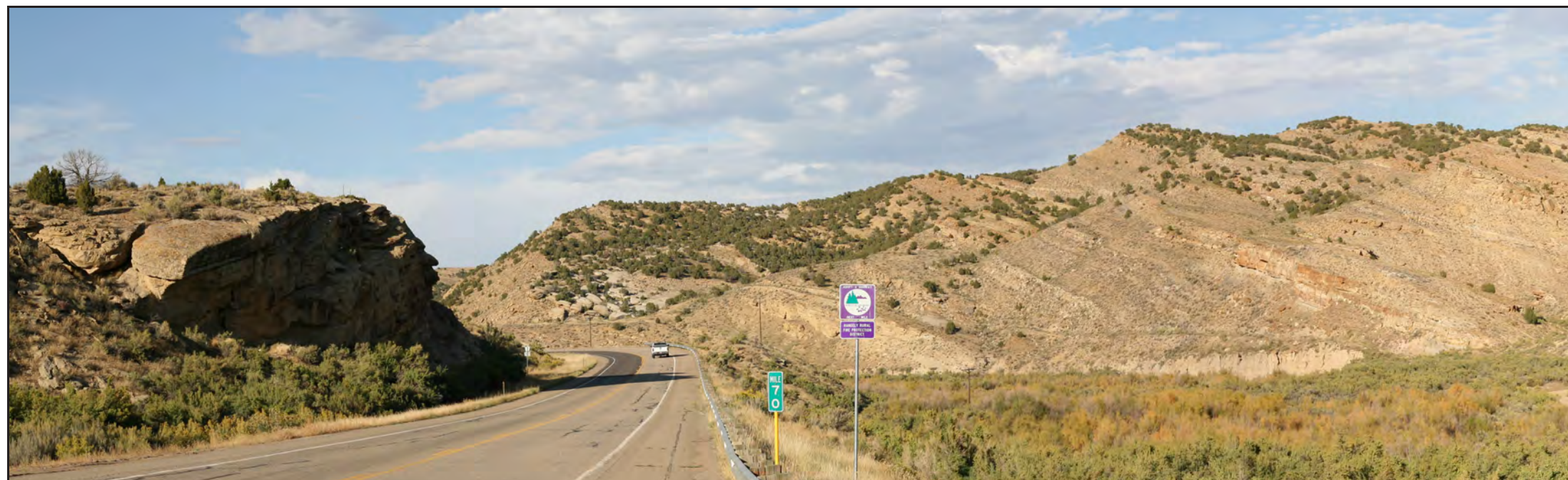
DRAFT

February 2014

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Photo Date and Time: October 11, 2011, 1:16 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 50-degree field of view)

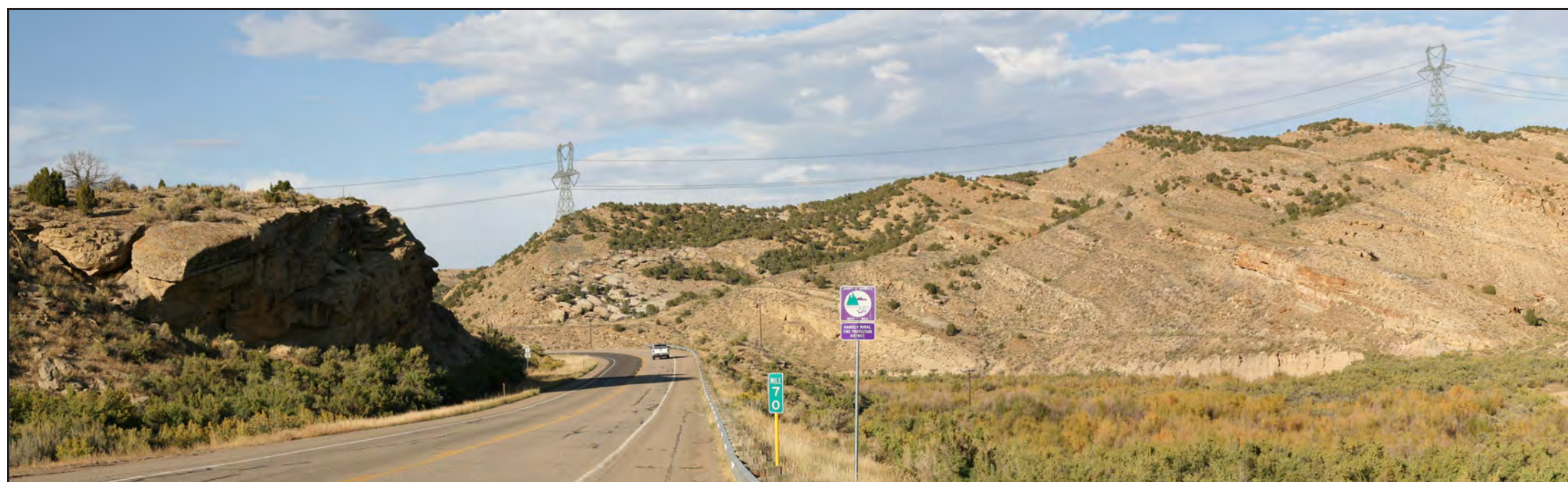
Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking northeast from the Dinosaur Diamond Scenic Byway (Colorado State Highway 139) in the Canyon Pintado National Historic District within BLM VRM Class III lands

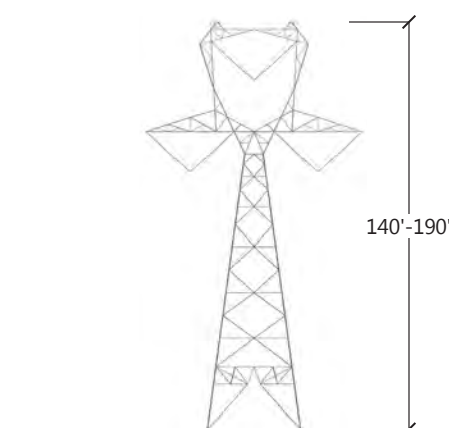


View Location: Approximate distance to proposed transmission line from photo location is 0.5 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #241 – Dinosaur Diamond in Canyon Pintado NHD (Colorado State Highway 139)

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February 2014

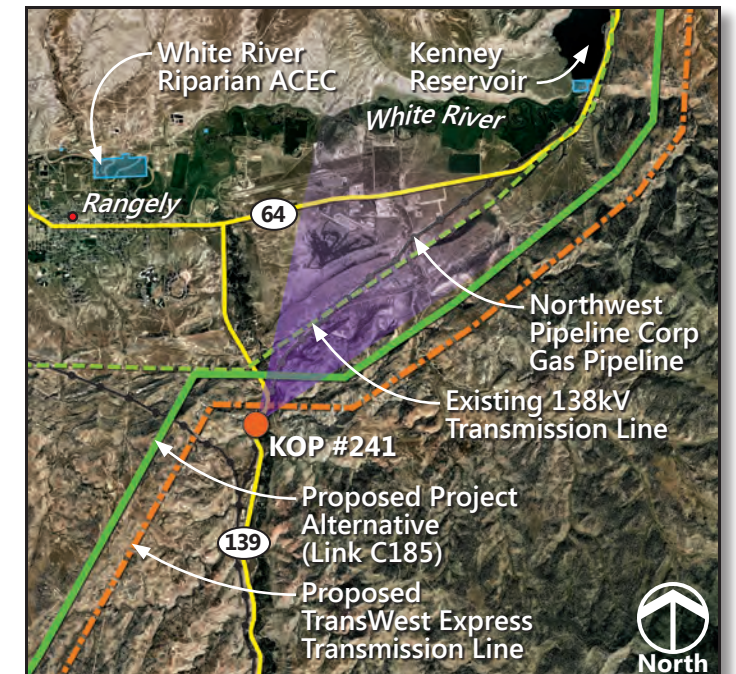
Page H3-36

Photo Date and Time: October 3, 2011, 5:07 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 45-degree field of view)

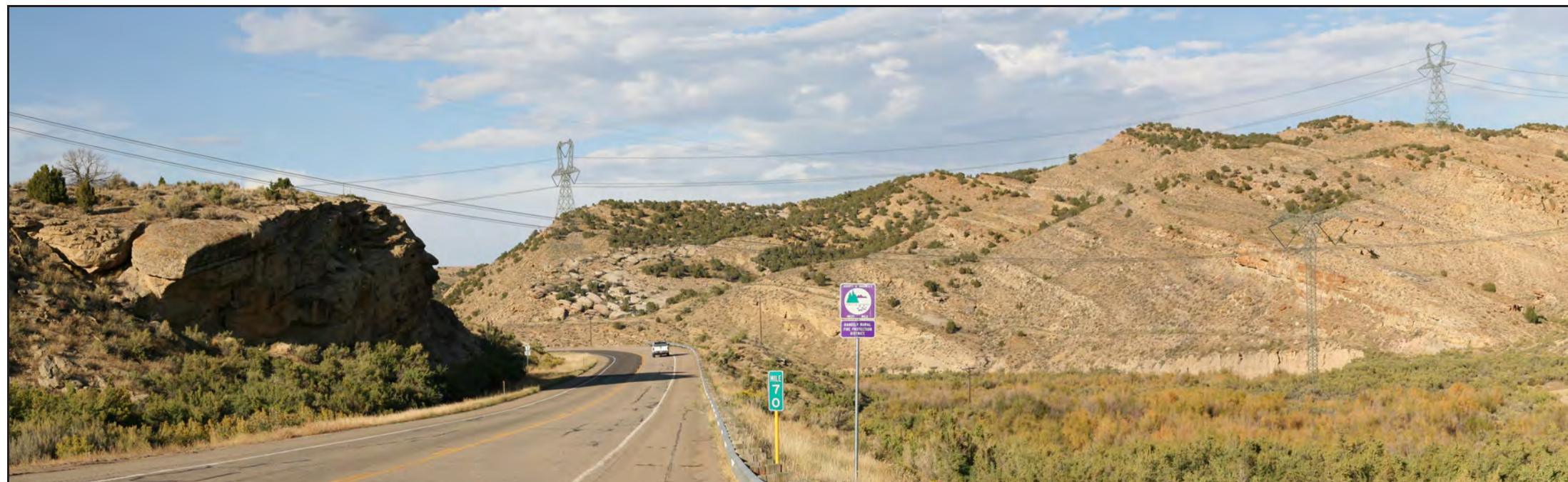
Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking northeast from the Dinosaur Diamond Scenic Byway (Colorado State Highway 139) in the Canyon Pintado National Historic District within BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 0.5 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #241 – Dinosaur Diamond in Canyon Pintado NHD (Colorado State Highway 139) Cumulative Effects

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February 2014

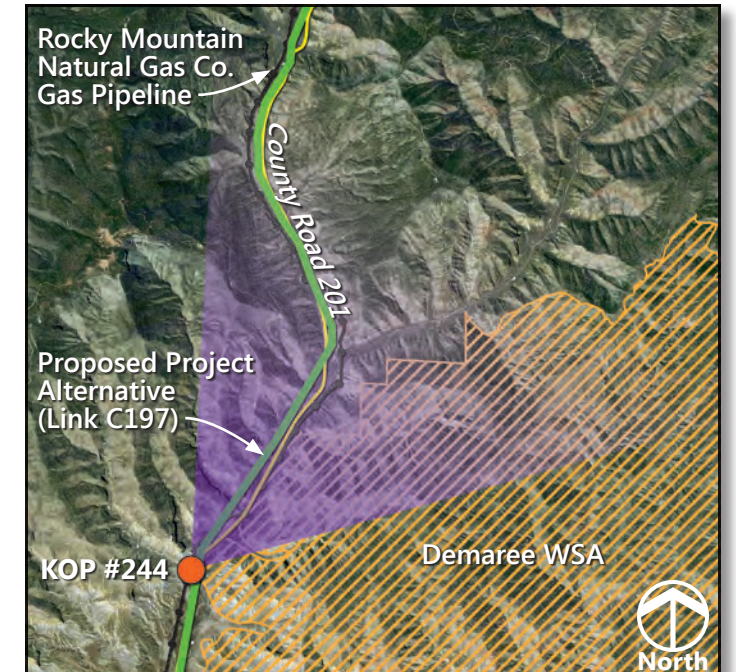
Page H3-37

Photo Date and Time: October 3, 2011, 5:07 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 45-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



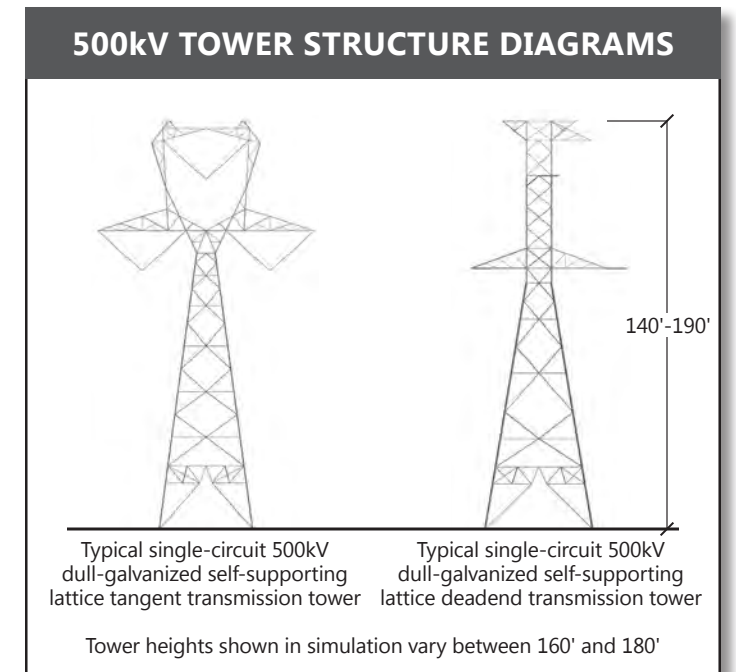
Existing Condition – View looking north from Garfield County Road 201, adjacent to the Demaree Wilderness Study Area, toward BLM VRM Class III lands



View Location: The photo location is adjacent to the proposed transmission line.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #244 – Garfield County Road 201
(South of Baxter Pass)

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February 2014

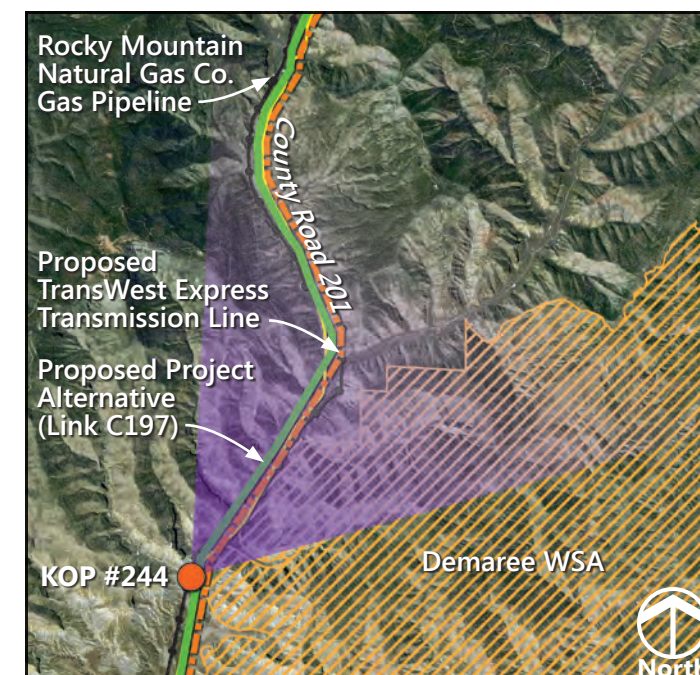
Page H3-38

Photo Date and Time: October 11, 2011, 2:13 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 72-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



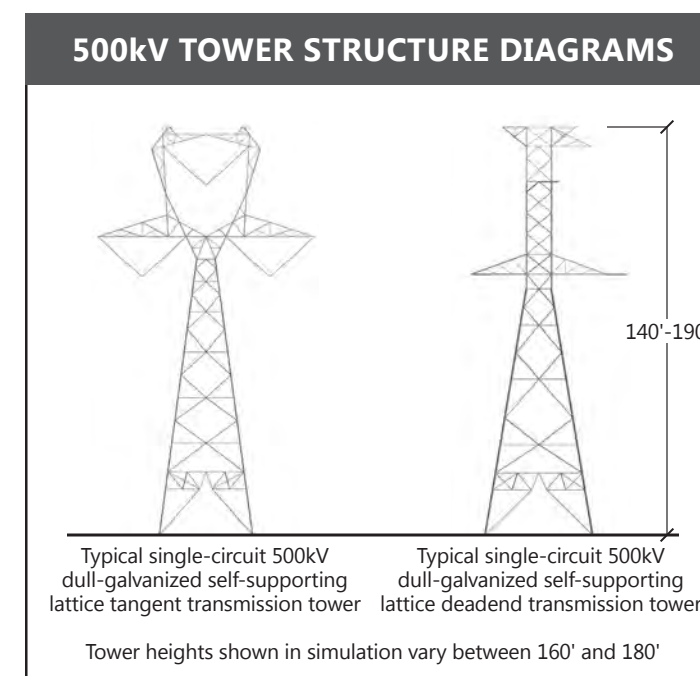
Existing Condition – View looking north from Garfield County Road 201, adjacent to the Demaree Wilderness Study Area, toward BLM VRM Class III lands



View Location: The photo location is adjacent to the proposed transmission line.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #244 – Garfield County Road 201
(South of Baxter Pass)
Cumulative Effects

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Photo Date and Time: October 11, 2011, 2:13 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 72-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



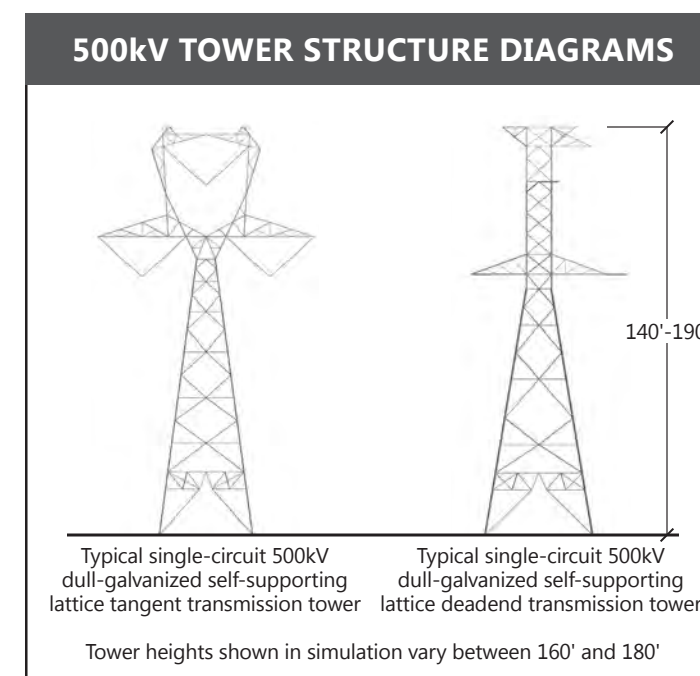
Existing Condition – View looking east from U.S. Highway 6 east of Wellington, Utah toward an existing 138kV transmission line and BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 0.4 mile.



Simulated Condition – View of Alternative COUT-I



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #256 – U.S. Highway 6 east of Wellington

Photo Date and Time: July 23, 2012, 10:52 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 76-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

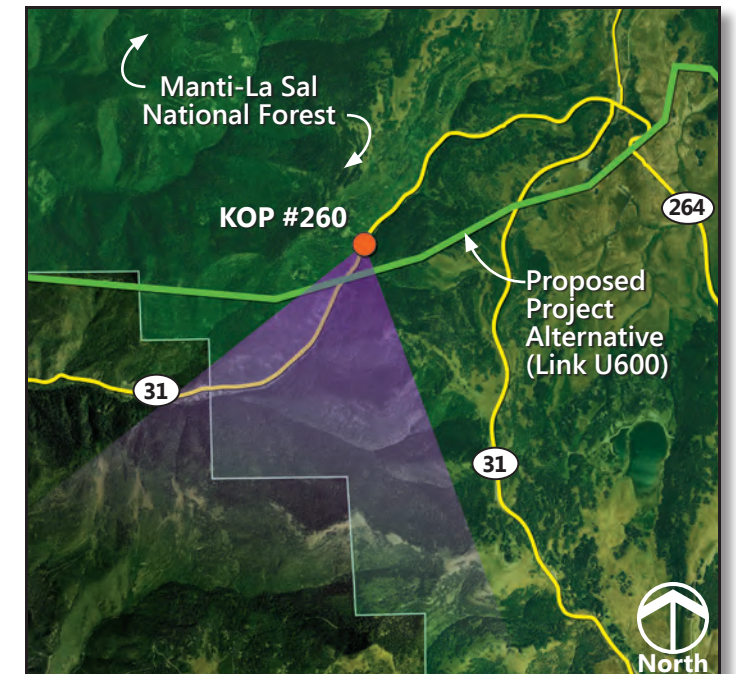
DRAFT

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Existing Condition – View looking south from Utah State Route 31 within the Manti-La Sal National Forest



View Location: Approximate distance to proposed transmission line from photo location is 0.2 mile.



Simulated Condition – View of Alternatives COUT-BAX-E and COUT H



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #260 – Energy Loop Scenic Byway (Utah SR 31)

Photo Date and Time: September 27, 2011, 1:21 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 66-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

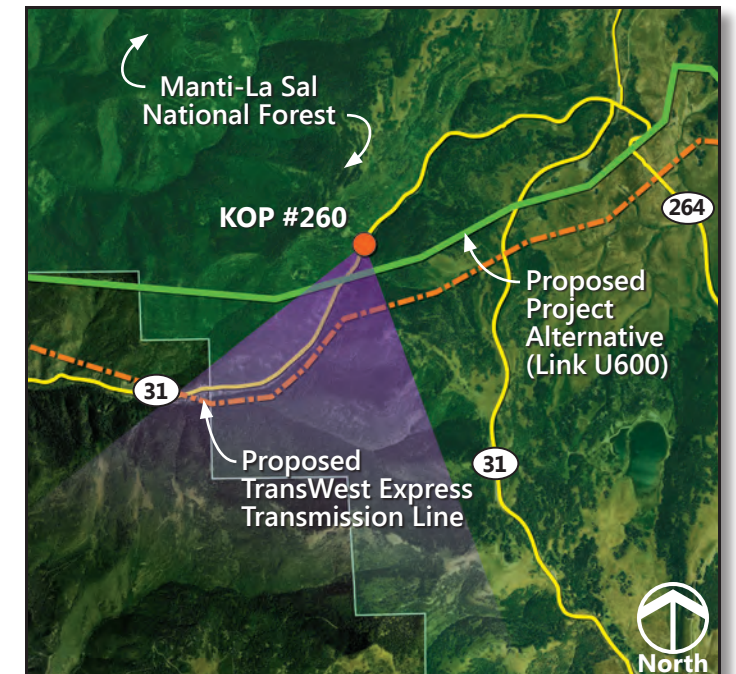
DRAFT

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Existing Condition – View looking south from Utah State Route 31 within the Manti-La Sal National Forest



View Location: Approximate distance to proposed transmission line from photo location is 0.2 mile.



Simulated Condition – View of Alternatives COUT-BAX-E and COUT H, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #260 – Energy Loop Scenic Byway (Utah SR 31) Cumulative Effects

DRAFT

February 2014

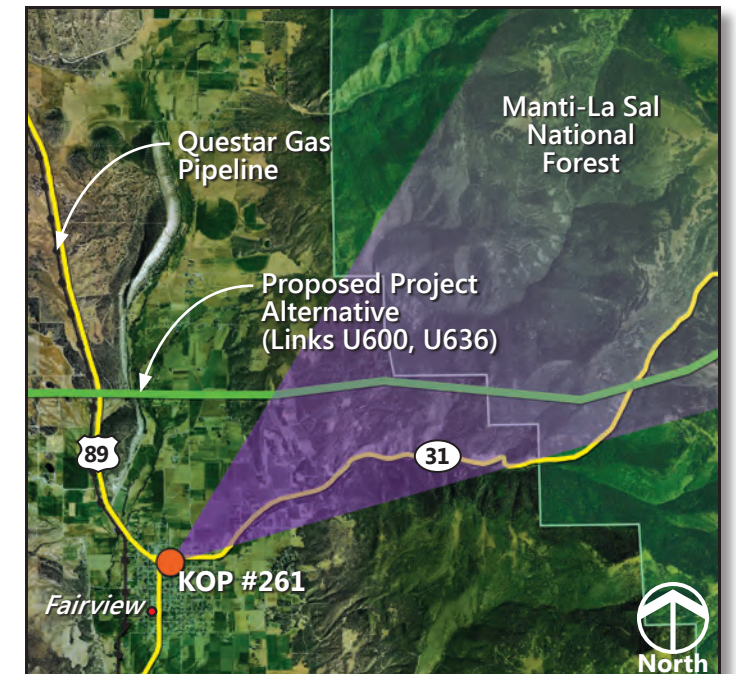
Page H3-42

Photo Date and Time: September 27, 2011, 1:21 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 66-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking northeast from the community of Fairview toward Fairview Canyon on the Manti-La Sal National Forest



View Location: Approximate distance to proposed transmission line from photo location is 2.1 miles.



Simulated Condition – View of Alternatives COUT BAX-E and COUT-H



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #261 – Fairview Residential

Photo Date and Time: September 26, 2011, 5:13 p.m. Focal Length: 50mm

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

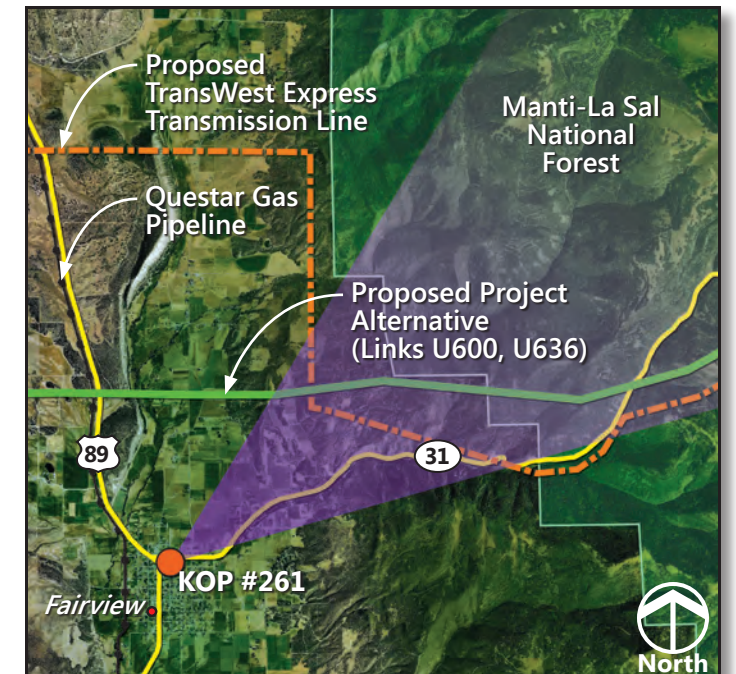
DRAFT

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Existing Condition – View looking northeast from the community of Fairview toward Fairview Canyon on the Manti-La Sal National Forest



View Location: Approximate distance to proposed transmission line from photo location is 2.1 miles.



Simulated Condition – View of Alternatives COUT BAX-E and COUT-H, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #261 – Fairview Residential Cumulative Effects

DRAFT

February 2014

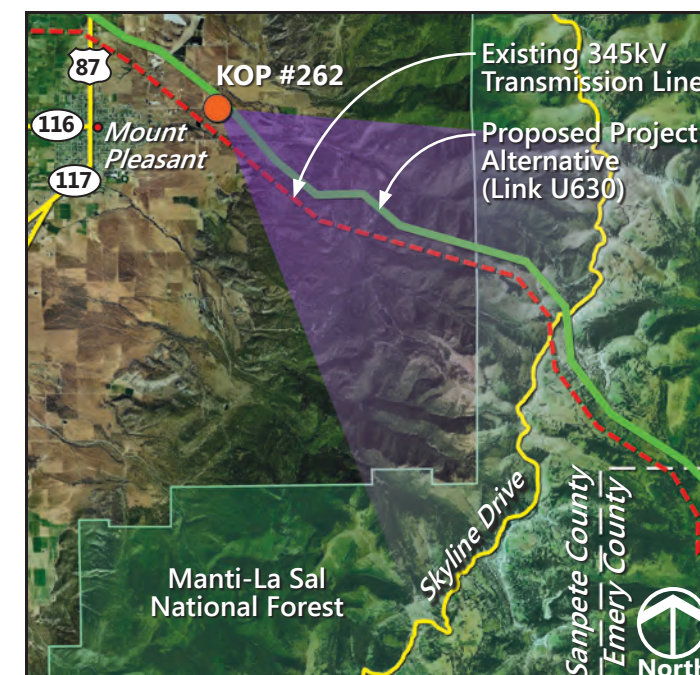
Page H3-44

Photo Date and Time: September 26, 2011, 5:13 p.m. Focal Length: 50mm

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



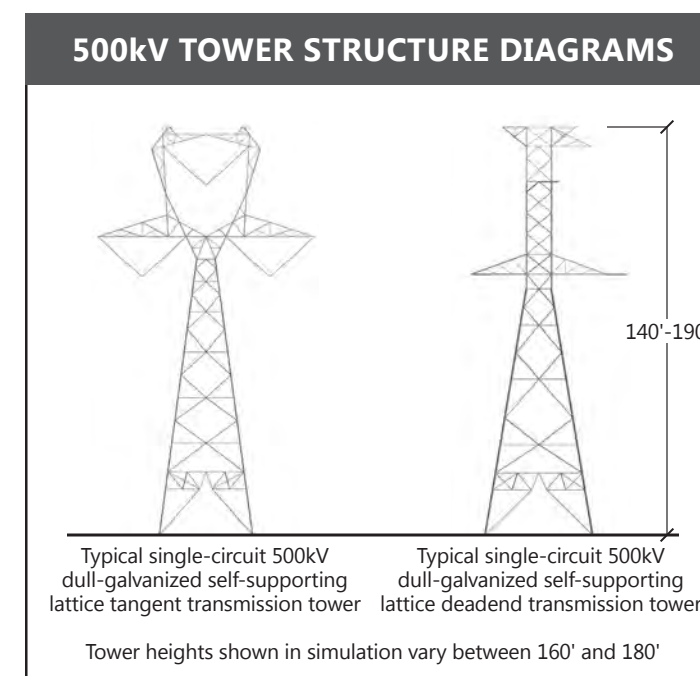
Existing Condition – View looking southeast from dispersed residences east of Mount Pleasant, Utah, toward the Manti-La Sal National Forest and an existing 345kV transmission line



View Location: Approximate distance to proposed transmission line from photo location is 0.5 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT-I



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #262 – Dispersed Residences East of Mount Pleasant

Photo Date and Time: September 26, 2011, 5:39 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a ##-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

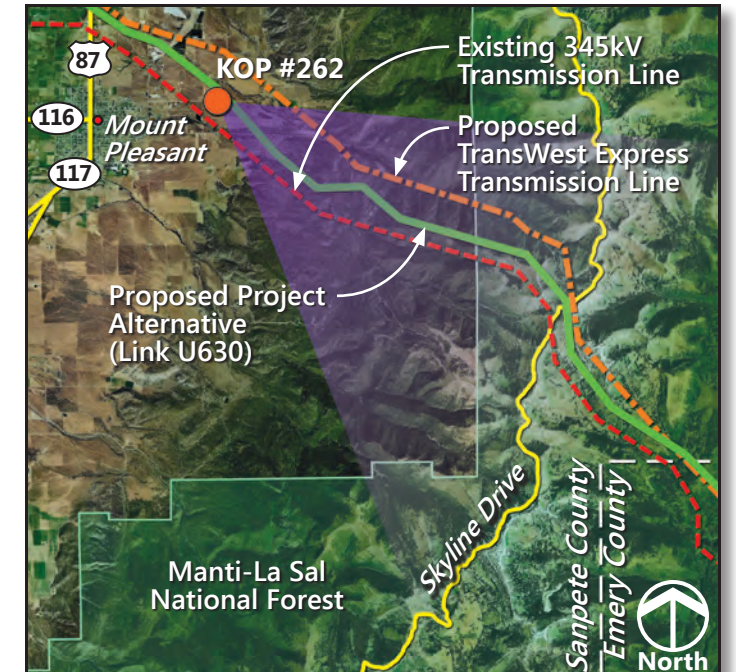
DRAFT

February 2014

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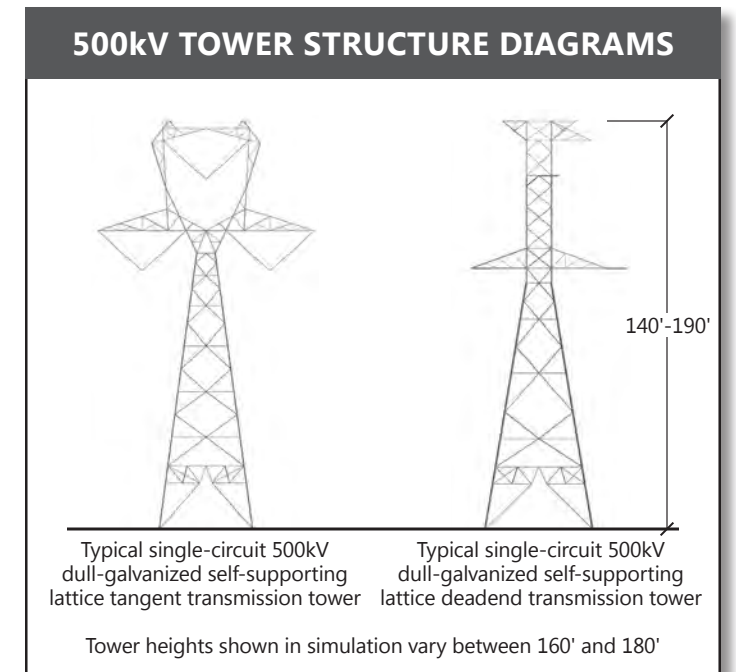
Existing Condition – View looking southeast from dispersed residences east of Mount Pleasant, Utah, toward the Manti-La Sal National Forest and an existing 345kV transmission line



View Location: Approximate distance to proposed transmission line from photo location is 0.5 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT-I, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #262 – Dispersed Residences East of Mount Pleasant Cumulative Effects

DRAFT

February 2014

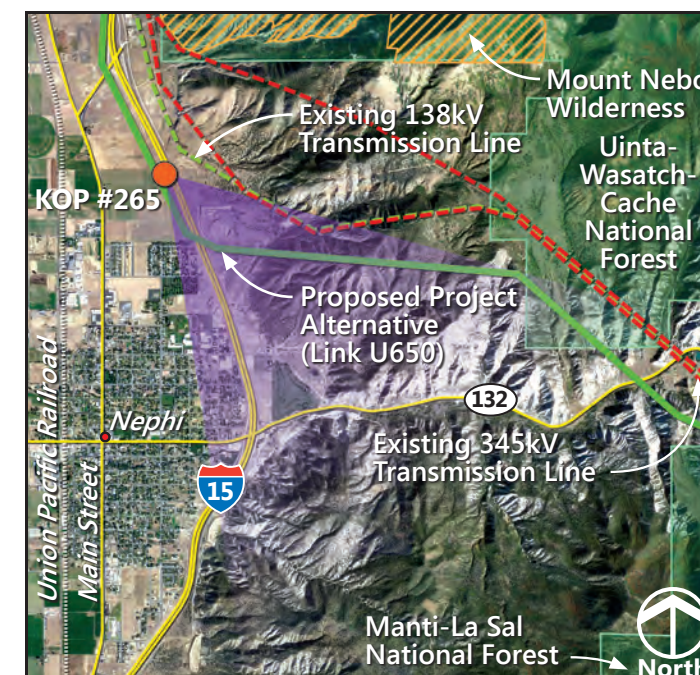
Page H3-46

Photo Date and Time: September 26, 2011, 5:39 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 64-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



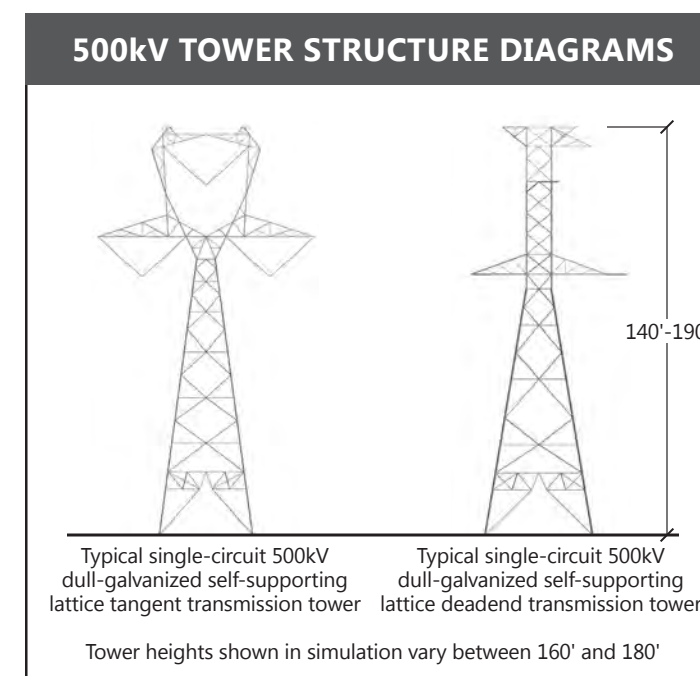
Existing Condition – View looking southeast from the shoulder of Interstate 15 toward Salt Creek Peak and the Manti-La Sal National Forest



View Location: Approximate distance of proposed transmission line from photo location is 0.2 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, COUT BAX-E, COUT-A (and route variation), COUT-B (and route variations), COUT-C (and route variations), COUT-H, and COUT-I



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #265 – Interstate 15 (Nephi)

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Photo Date and Time: September 26, 2011, 2:18 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 61-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



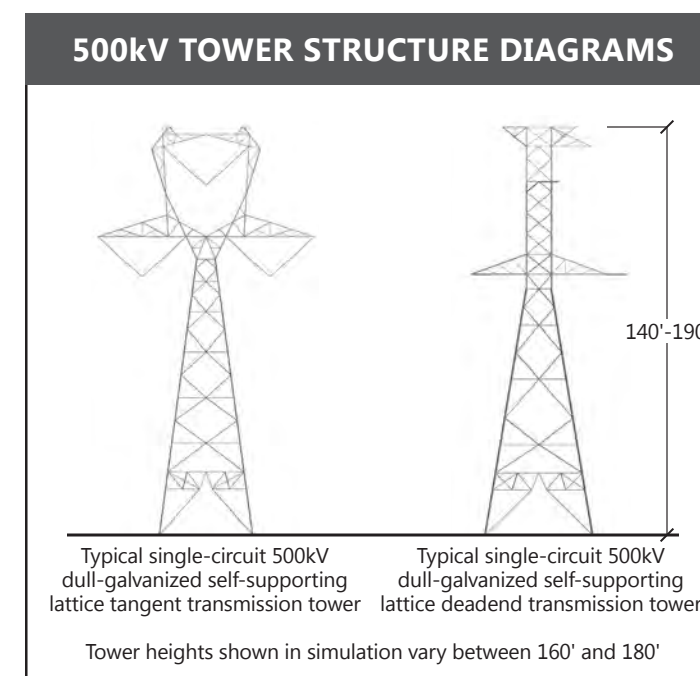
Existing Condition – View looking southeast from the shoulder of Interstate 15 toward Salt Creek Peak and the Manti-La Sal National Forest



View Location: Approximate distance of proposed transmission line from photo location is 0.2 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, COUT BAX-E, COUT-A (and route variation), COUT-B (and route variations), COUT-C (and route variations), COUT-H, AND COUT-I, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #265 – Interstate 15 (Nephi)
Cumulative Effects

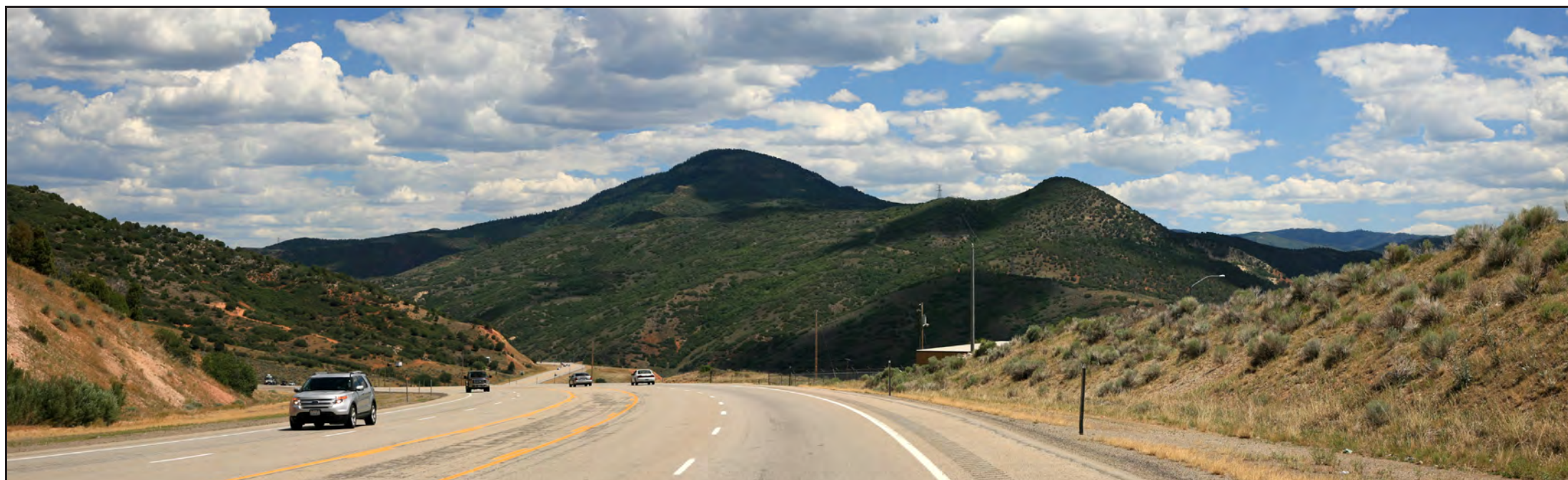
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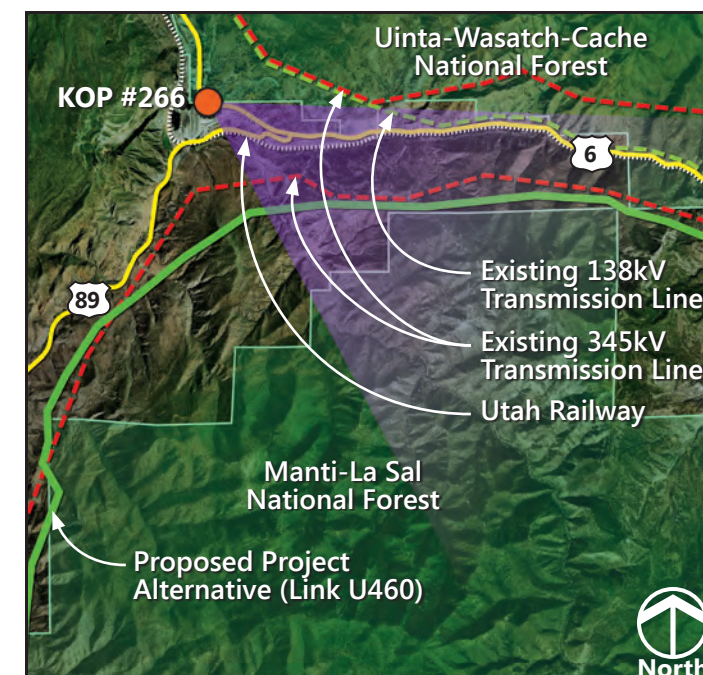
Page H3-48

Photo Date and Time: September 26, 2011, 2:18 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 61-degree field of view)

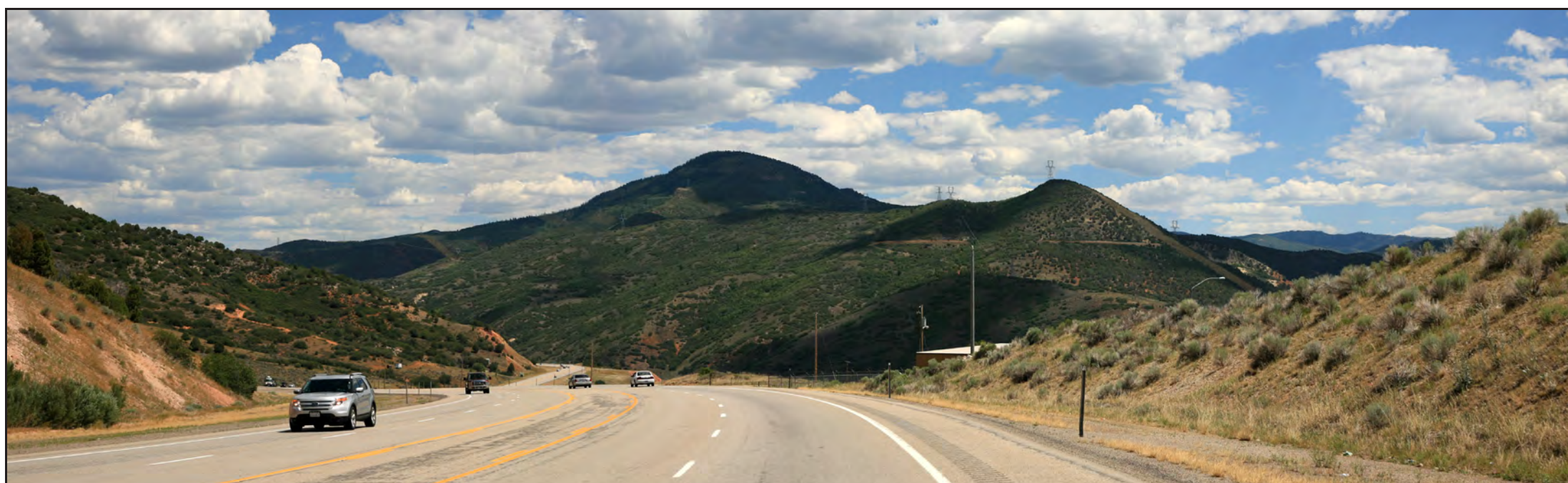
Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



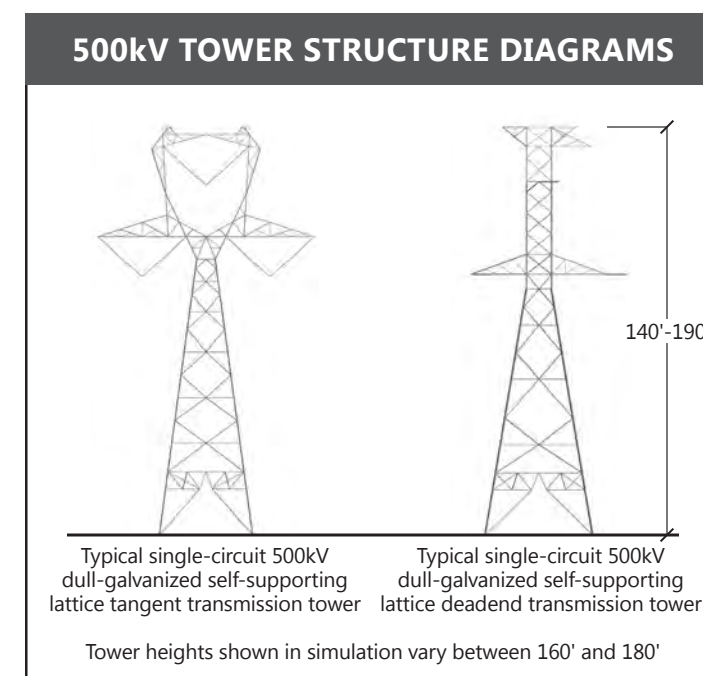
Existing Condition – View looking east from southbound lane of U.S. Highway 6 toward Sky High Peak in the Manti-La Sal National Forest



View Location: Approximate distance of proposed transmission line from photo location is 1.5 miles.



Simulated Condition – View of Alternatives COUT-A (and route variation), COUT-B (and route variations), and COUT-C (and route variations)



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #266 – U.S. Highway 6
(Spanish Fork Canyon)

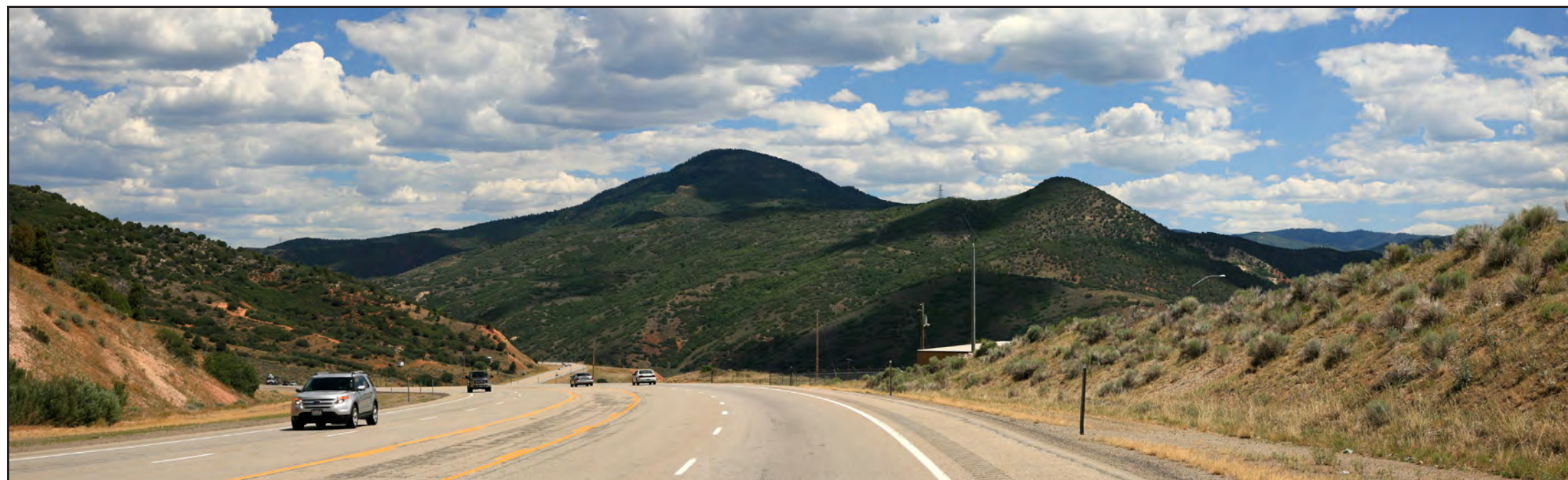
Photo Date and Time: July 26, 2011, 2:57 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 55-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

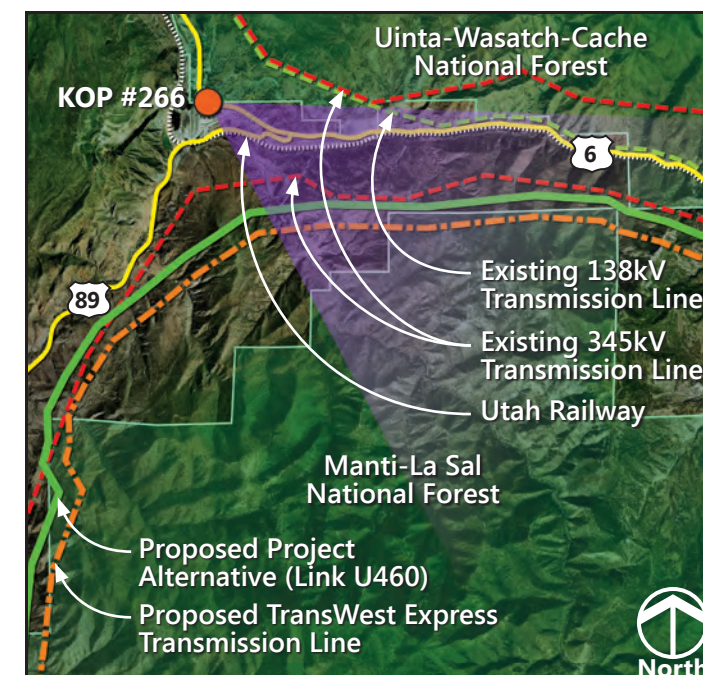
DRAFT

February 2014

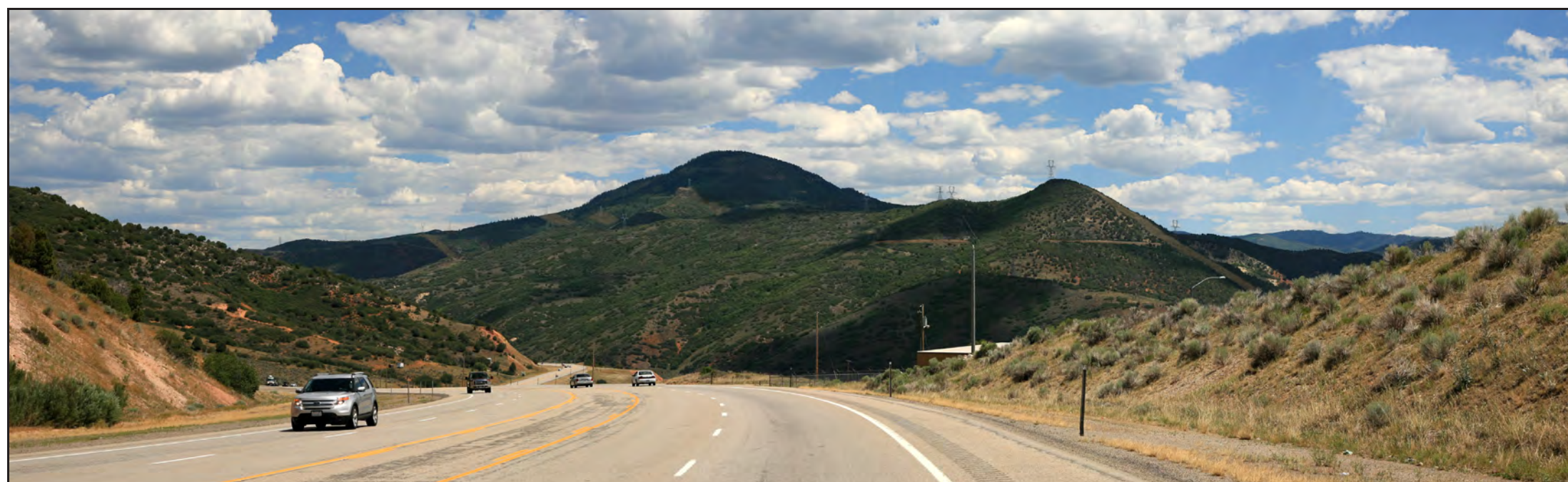
Page H3-49



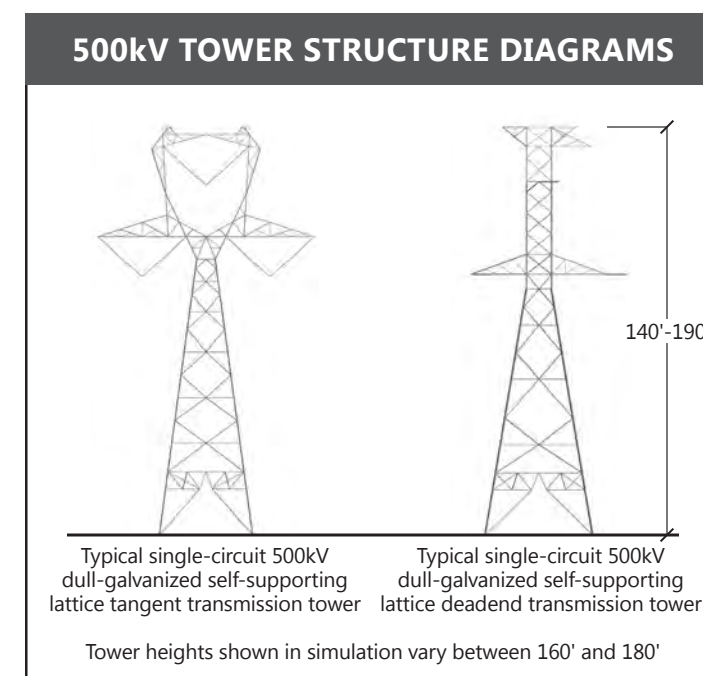
Existing Condition – View looking east from southbound lane of U.S. Highway 6 toward Sky High Peak in the Manti-La Sal National Forest



View Location: Approximate distance of proposed transmission line from photo location is 1.5 miles.



Simulated Condition – View of Alternatives COUT-A (and route variation), COUT-B (and route variations), and COUT-C (and route variations), and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #266 – U.S. Highway 6
(Spanish Fork Canyon)
Cumulative Effects

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Photo Date and Time: July 26, 2011, 2:57 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 55-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



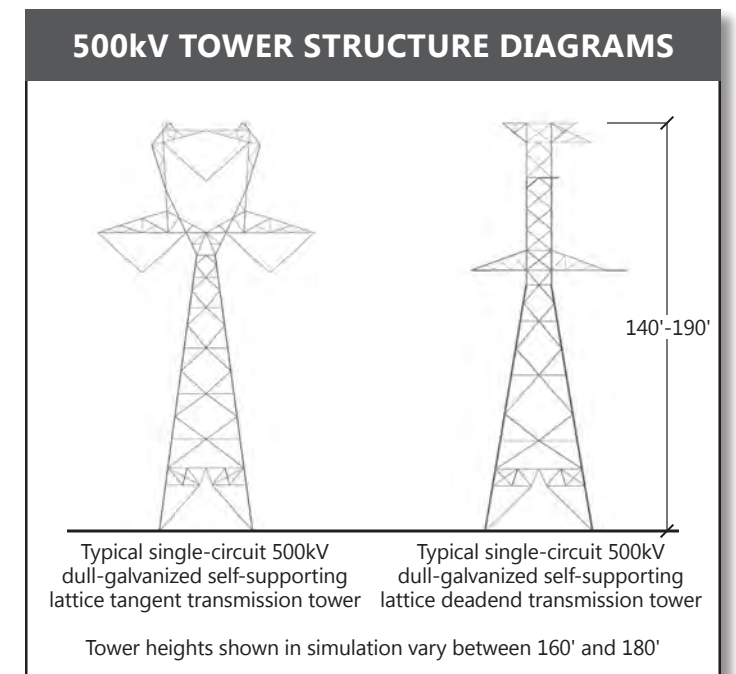
Existing Condition – View looking northeast from residences in Fruitland, Utah, toward an existing 345kV transmission line



View Location: Approximate distance to proposed transmission line from photo location is 0.3 mile.



Simulated Condition – View of Alternative COUT-A (and route variation)



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #269 – Fruitland Residential

Photo Date and Time: September 30, 2011, 7:53 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 57-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

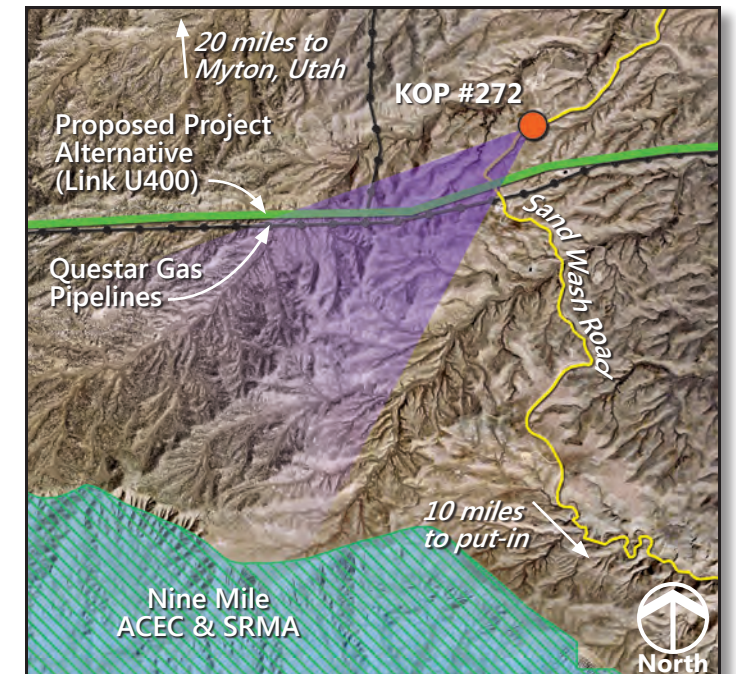
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Existing Condition – View looking southwest from Sand Wash Road, 20 miles south of Myton, Utah, toward BLM VRM Class IV lands



View Location: Approximate distance of proposed transmission line from photo location is 0.5 mile.



Simulated Condition – View of Alternatives COUT-C (and route variations), COUT-H, and COUT-I



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #272 – Sand Wash North Destination Route

Photo Date and Time: September 28, 2011, 1:44 p.m. Focal Length: 50mm

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

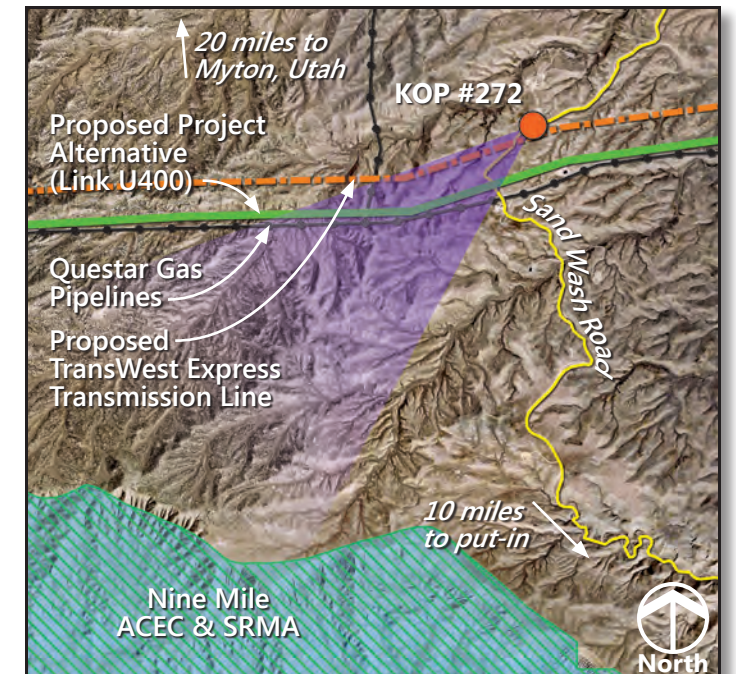
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Existing Condition – View looking southwest from Sand Wash Road, 20 miles south of Myton, Utah, toward BLM VRM Class IV lands



View Location: Approximate distance of proposed transmission line from photo location is 0.5 mile.



Simulated Condition – View of Alternatives COUT-C (and route variations), COUT-H, and COUT-I, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #272 – Sand Wash North Destination Route Cumulative Effects

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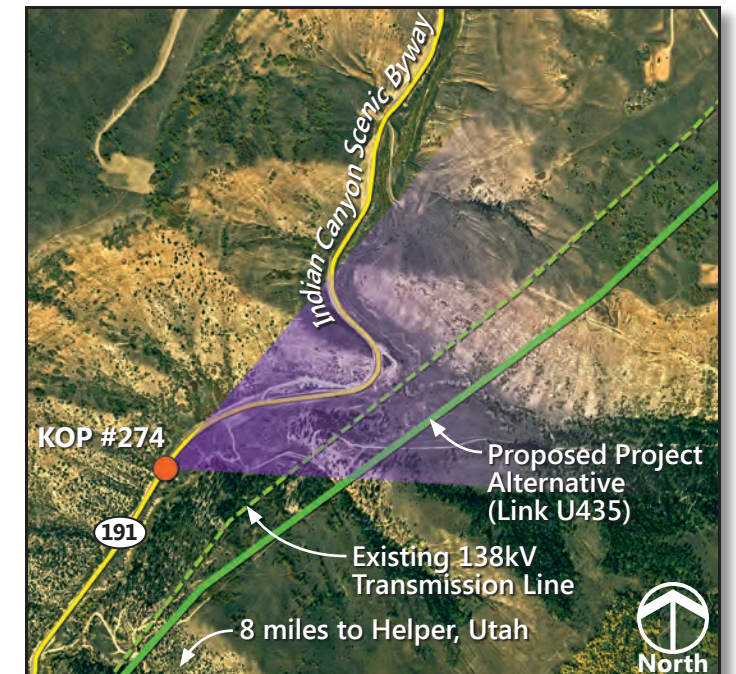
Photo Date and Time: September 28, 2011, 1:44 p.m. Focal Length: 50mm

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking northeast from U.S. Highway 191

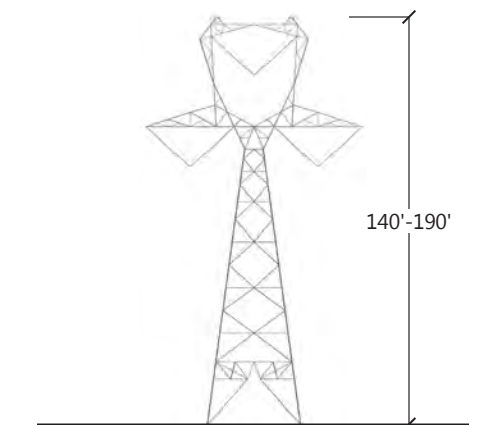


View Location: Approximate distance to proposed transmission line from photo location is 0.4 mile.



Simulated Condition – View of Alternative COUT-H

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #274 – Indian Canyon Scenic Byway (U.S. Highway 191)

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February 2014

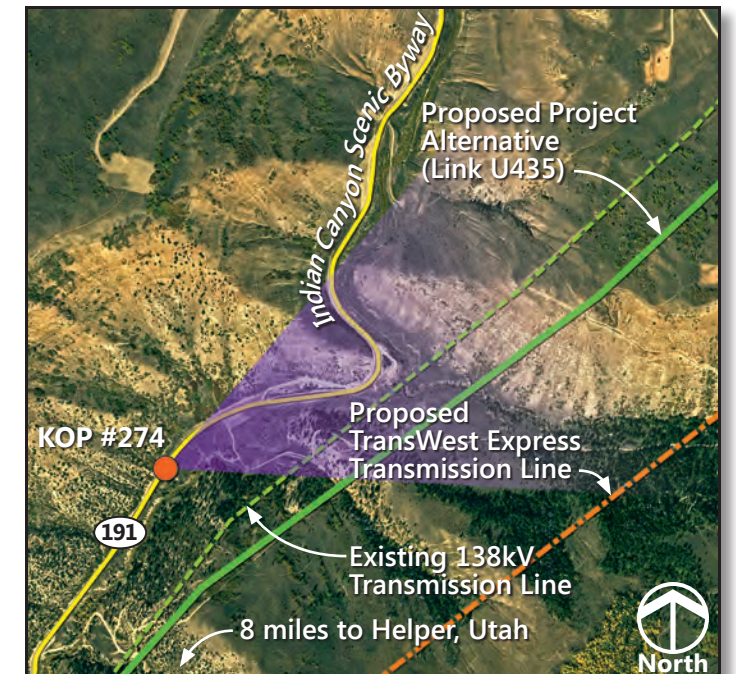
Page H3-54

Photo Date and Time: September 28, 2011, 8:44 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 51-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking northeast from U.S. Highway 191



View Location: Approximate distance to proposed transmission line from photo location is 0.4 mile.



Simulated Condition – View of Alternative COUT-H and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #274 – Indian Canyon Scenic Byway
(U.S. Highway 191)
Cumulative Effects

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Photo Date and Time: September 28, 2011, 8:44 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 51-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking north from the Old Spanish National Historic Trail, east of Thompson Springs, Utah, toward the Denver and Rio Grande (D&RG) Western Railroad and BLM VRM Class III lands

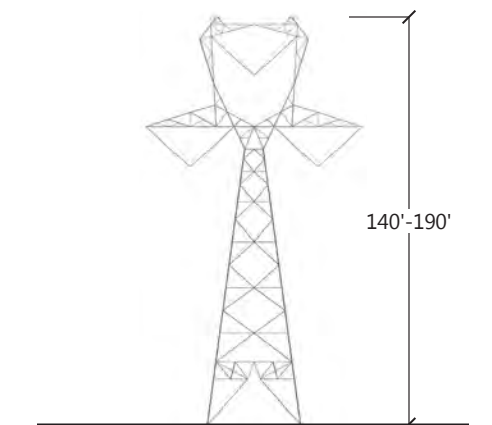


View Location: Approximate distance to proposed transmission line from photo location is 0.7 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #279 – Old Spanish National Historic Trail

Photo Date and Time: July 23, 2012, 3:18 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 56-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

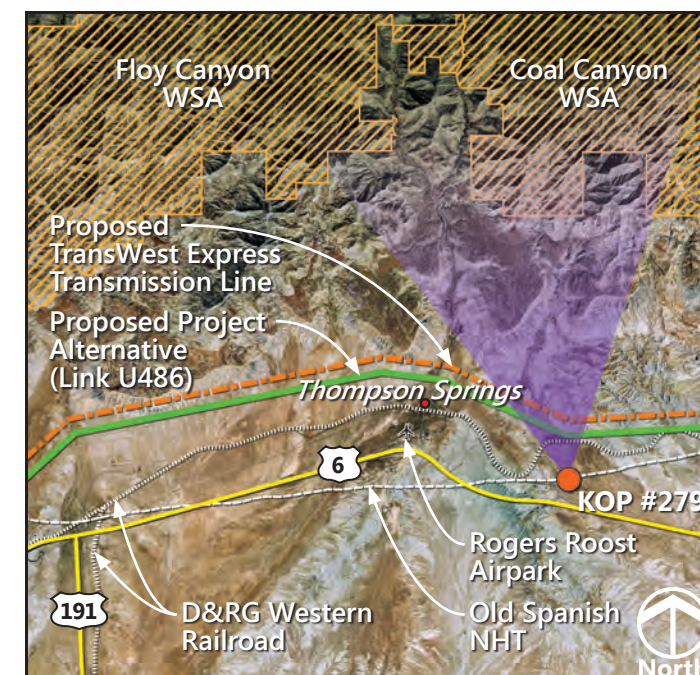
DRAFT

February 2014

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Existing Condition – View looking north from the Old Spanish National Historic Trail, east of Thompson Springs, Utah, toward the Denver and Rio Grande (D&RG) Western Railroad and BLM VRM Class III lands

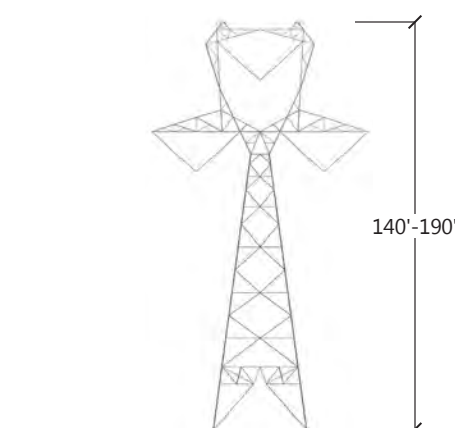


View Location: Approximate distance to proposed transmission line from photo location is 0.7 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E, and the proposed TransWest Express transmission line

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #279 – Old Spanish National Historic Trail Cumulative Effects

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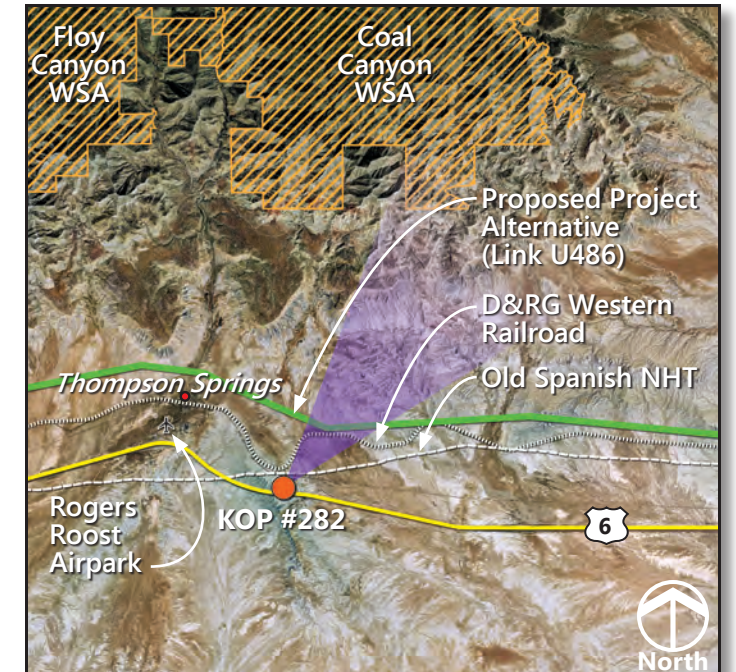
Photo Date and Time: July 23, 2012, 3:18 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 56-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking northeast from the Thompson Welcome Center toward the Book Cliffs, the Denver and Rio Grande (D&RG) Western Railroad, and BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 1.1 miles.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #282 – Thompson Welcome Center

DRAFT

February 2014

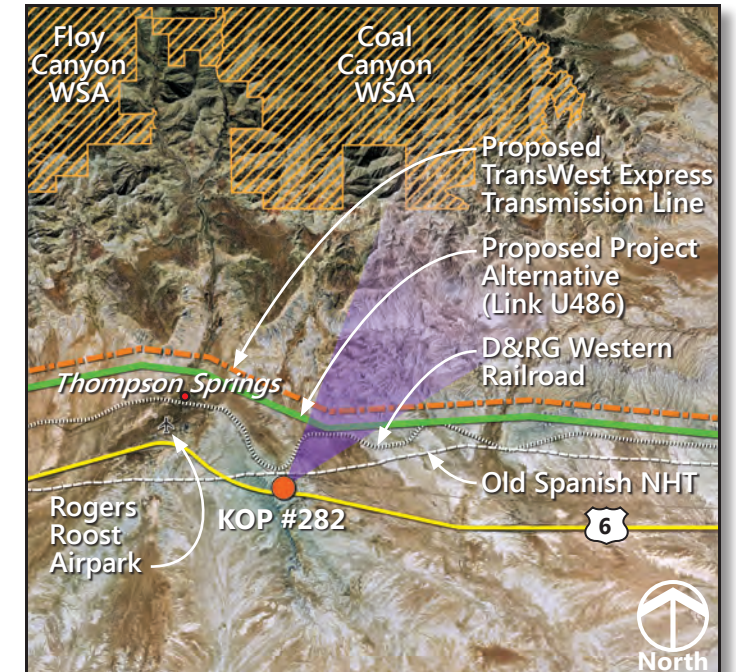
Page H3-58

Photo Date and Time: July 23, 2012, 2:57 p.m. Focal Length: 50mm

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking northeast from the Thompson Welcome Center toward the Book Cliffs, the Denver and Rio Grande (D&RG) Western Railroad, and BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 1.1 miles.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #282 – Thompson Welcome Center
Cumulative Effects

DRAFT

February 2014

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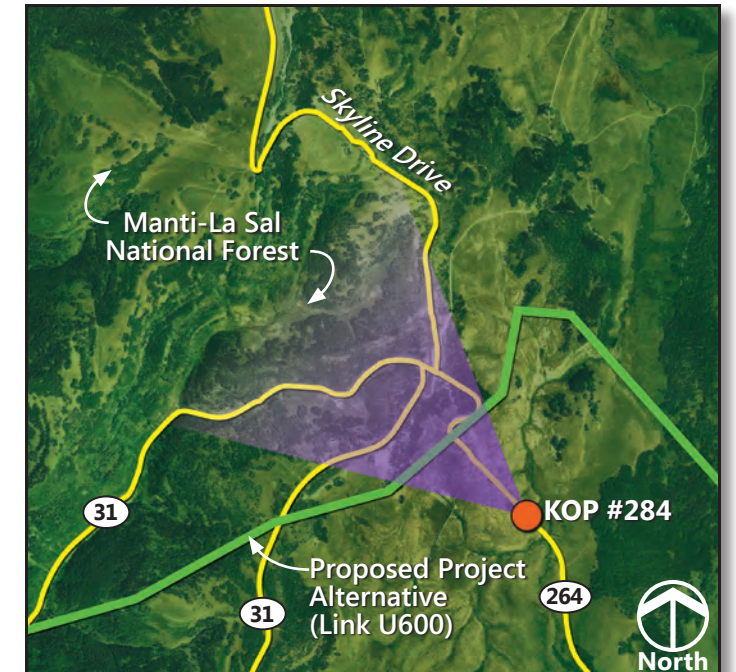
Photo Date and Time: July 23, 2012, 2:57 p.m. Focal Length: 50mm

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking northwest from Utah State Route 264 within the Manti-La Sal National Forest



View Location: Approximate distance to proposed transmission line from photo location is 0.5 mile.



Simulated Condition – View of Alternatives COUT BAX-E and COUT-H



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #284 – Energy Loop Scenic Byway (Utah SR 264)

Photo Date and Time: July 26, 2011, 11:30 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 50-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

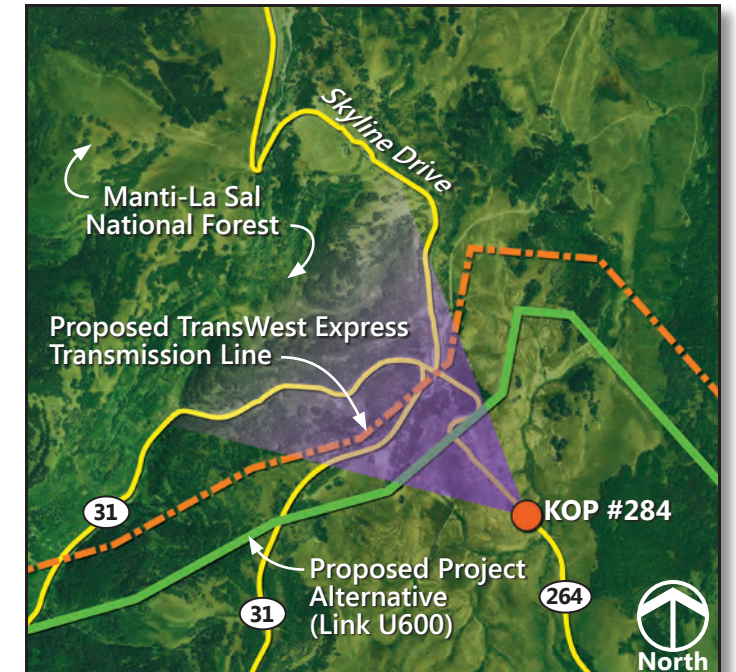
DRAFT

February 2014

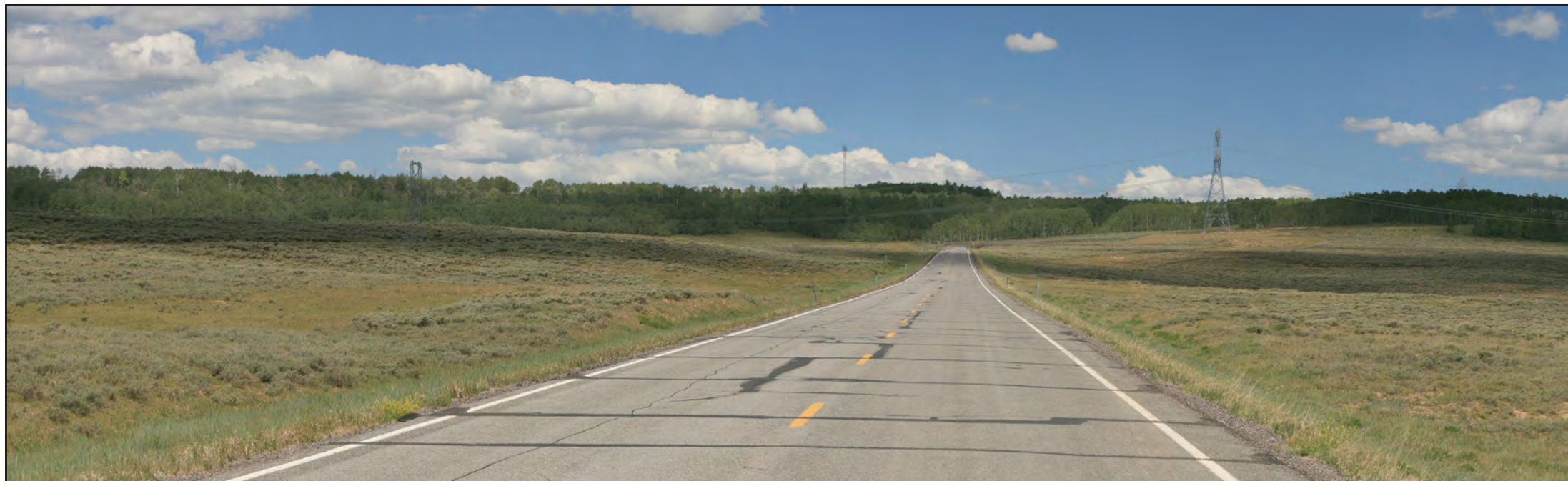
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Existing Condition – View looking northwest from Utah State Route 264 within the Manti-La Sal National Forest



View Location: Approximate distance to proposed transmission line from photo location is 0.5 mile.



Simulated Condition – View of Alternatives COUT BAX-E and COUT-H, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #284 – Energy Loop Scenic Byway (Utah SR 264) Cumulative Effects

DRAFT

February 2014

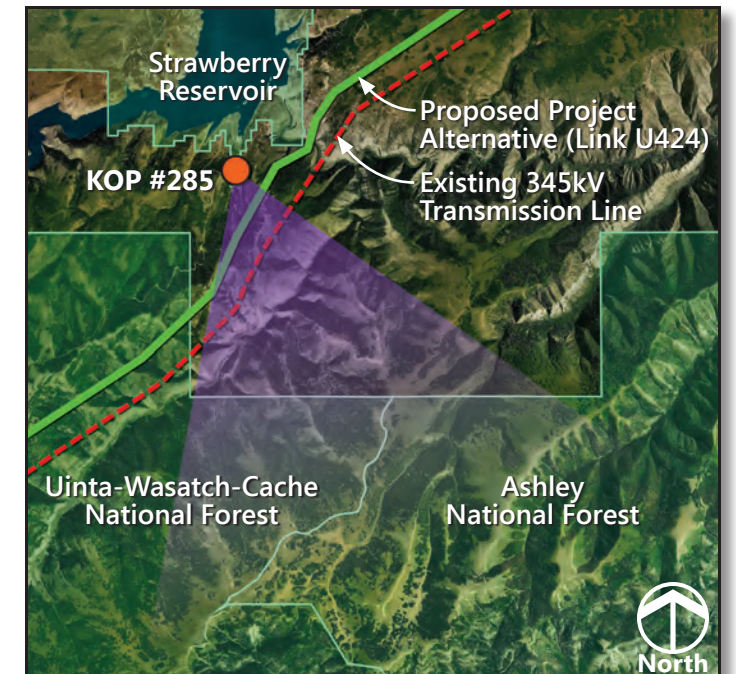
Page H3-61

Photo Date and Time: July 26, 2011, 11:30 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 50-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



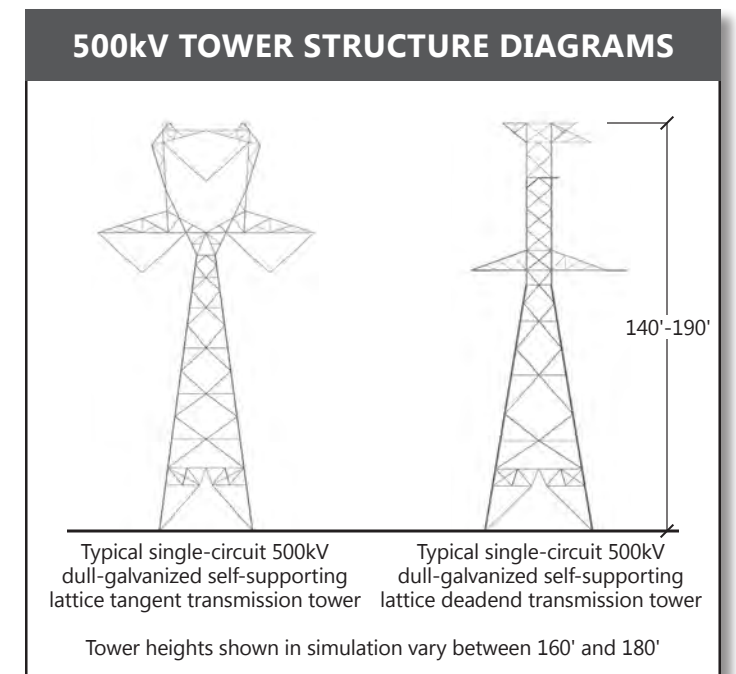
Existing Condition – View looking south from the Aspen Grove Campground, south of Strawberry Reservoir, in the Uinta-Wasatch-Cache National Forest



View Location: Approximate distance to proposed transmission line from photo location is 0.6 mile.



Simulated Condition – View of Alternative COUT-A (and route variation)



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #285 – Aspen Grove Campground

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February 2014

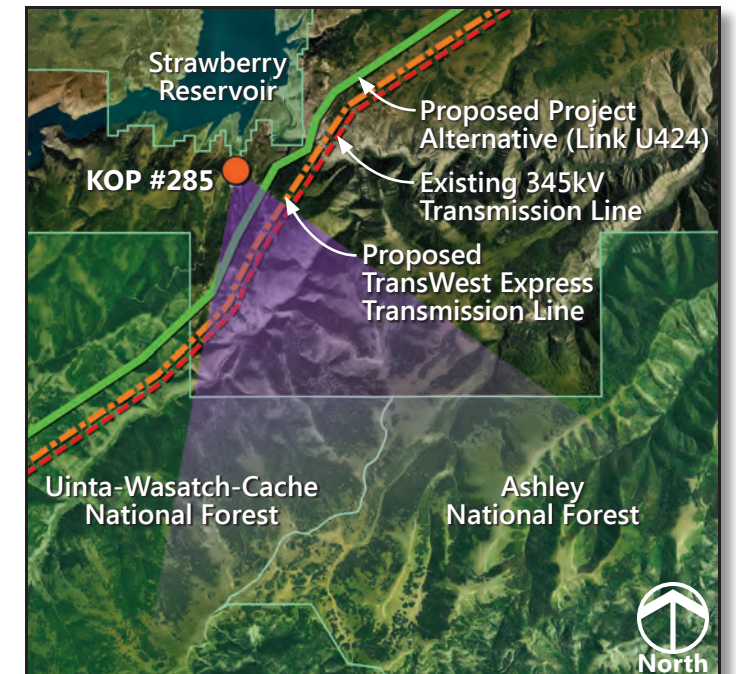
Page H3-62

Photo Date and Time: September 30, 2011, 10:51 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 61-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



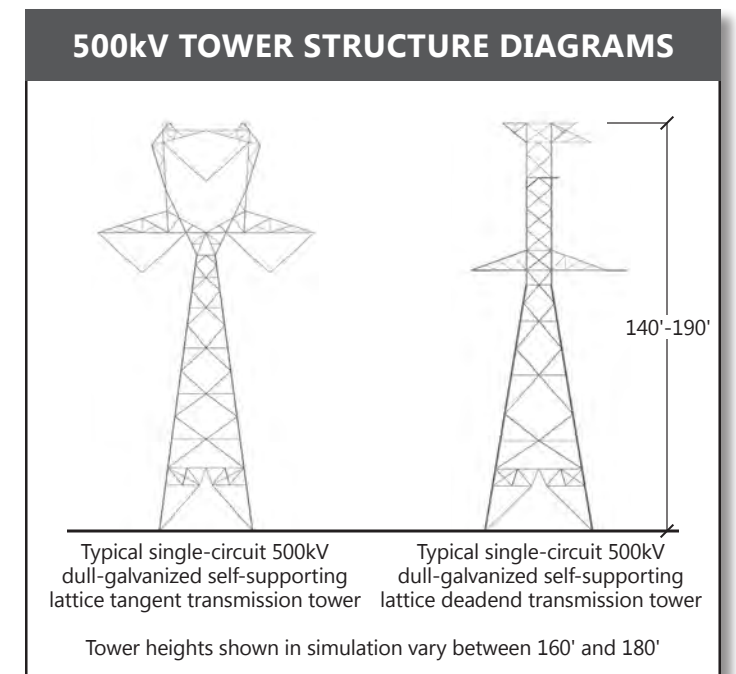
Existing Condition – View looking south from the Aspen Grove Campground, south of Strawberry Reservoir, in the Uinta-Wasatch-Cache National Forest



View Location: Approximate distance to proposed transmission line from photo location is 0.6 mile.



Simulated Condition – View of Alternative COUT-A (and route variation) and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #285 – Aspen Grove Campground Cumulative Effects

DRAFT

February 2014

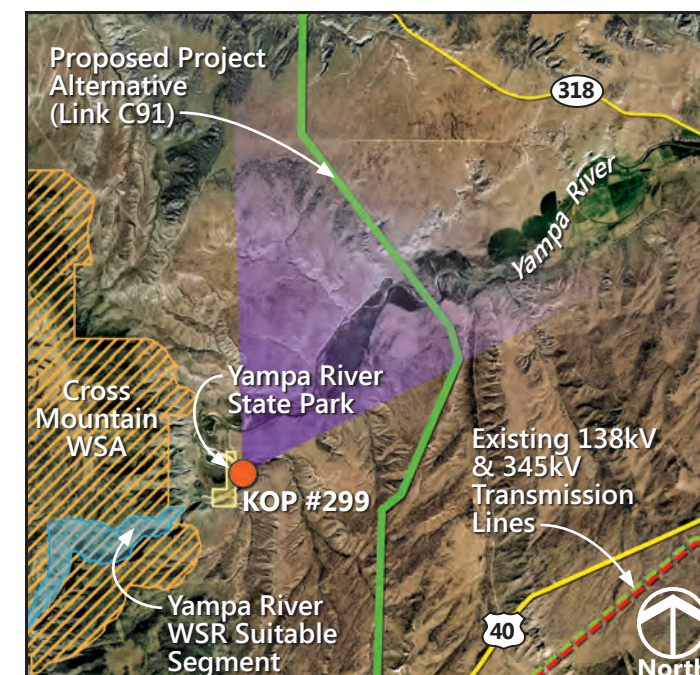
Page H3-63

Photo Date and Time: September 30, 2011, 10:51 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 61-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking northeast from the Yampa River access road (which provides access to the Cross Mountain WSA) toward BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 3 miles.



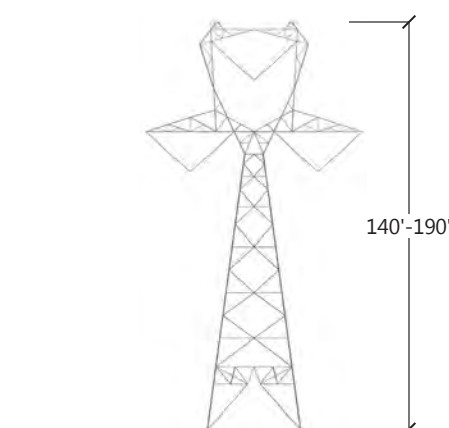
Simulated Condition – View of Alternatives WYCO-B (and route variations), WYCO-C (and route variations), and WYCO-F (and route variations)¹

¹Note: This view is in vicinity of Series Compensation Station Siting Area C – Maybell. Based on the final location, this facility may be visible and result in stronger visual contrast from this viewpoint.

Photo Date and Time: September 27, 2011, 5:32 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 69-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #299 – East Cross Mountain River Access (Yampa River)

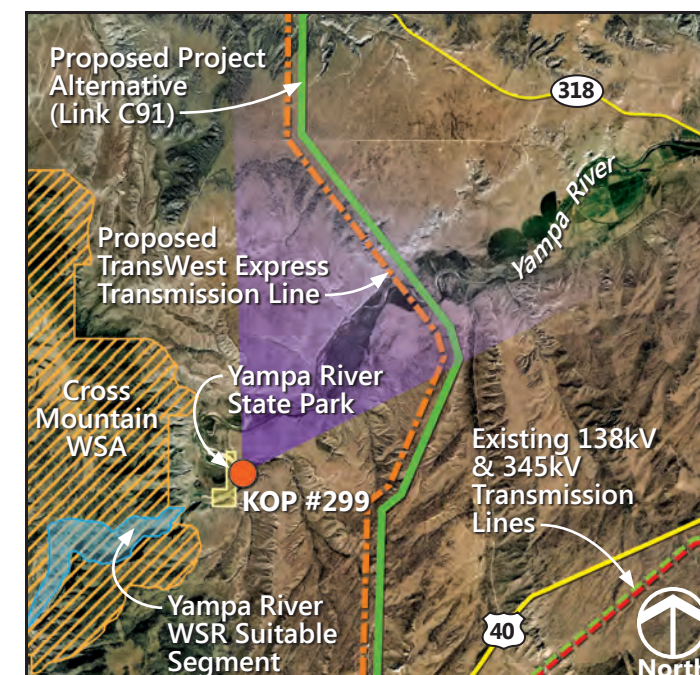
DRAFT

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Existing Condition – View looking northeast from the Yampa River access road (which provides access to the Cross Mountain WSA) toward BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 3 miles.



Simulated Condition – View of Alternatives WYCO-B (and route variations), WYCO-C (and route variations), and WYCO-F (and route variations)¹, and the proposed TransWest Express transmission line

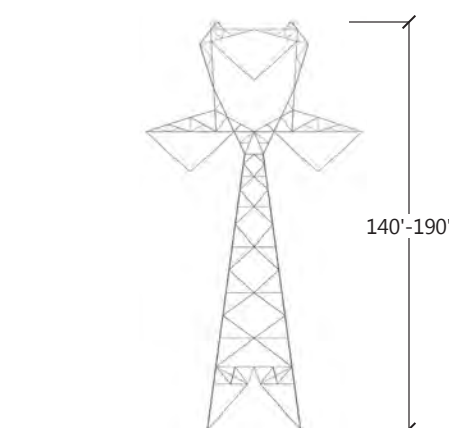
¹Note: This view is in vicinity of Series Compensation Station Siting Area C – Maybell. Based on the final location, this facility may be visible and result in stronger visual contrast from this viewpoint.

Photo Date and Time: September 27, 2011, 5:32 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 69-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

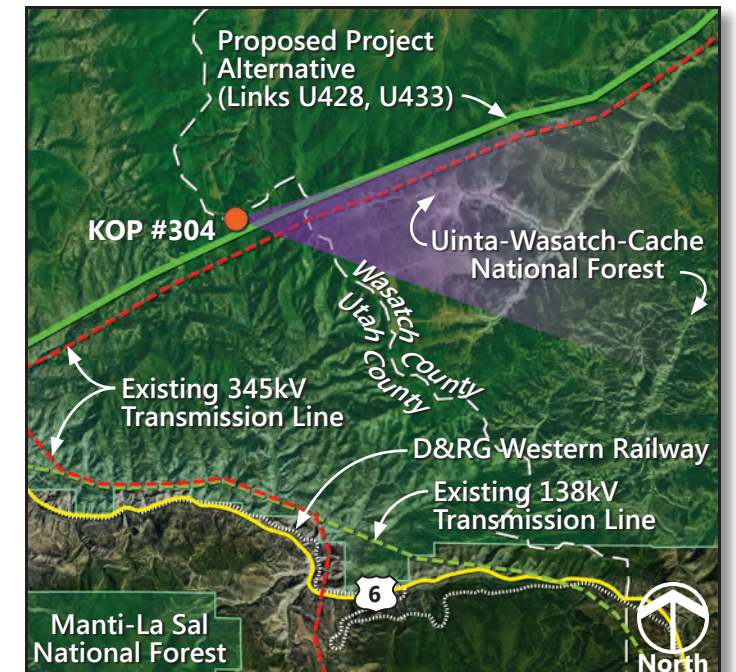
KOP #299 – East Cross Mountain River Access (Yampa River) Cumulative Effects

DRAFT

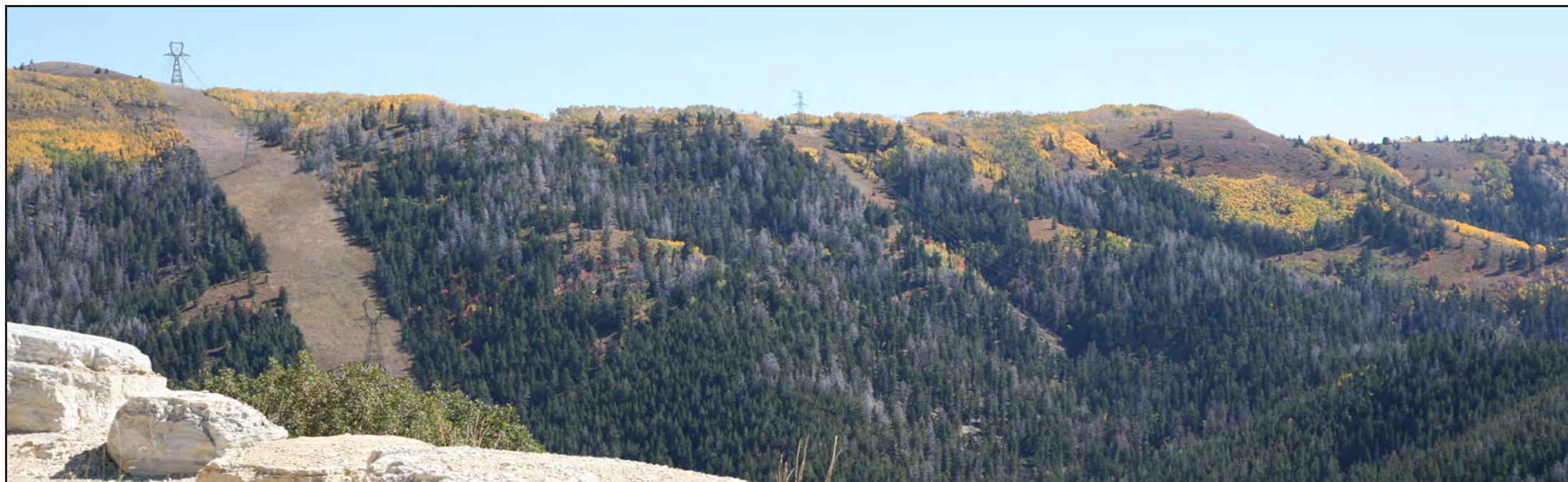
February 2014



Existing Condition – View looking east from Sheep Creek Road (Forest Road 042) in the Uinta-Wasatch-Cache National Forest



View Location: Approximate distance to proposed transmission line from photo location is 0.4 mile.



Simulated Condition – View of Route Variation COUT-A-1



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #304 – Sheep Creek Road (FR 042)

DRAFT

February 2014

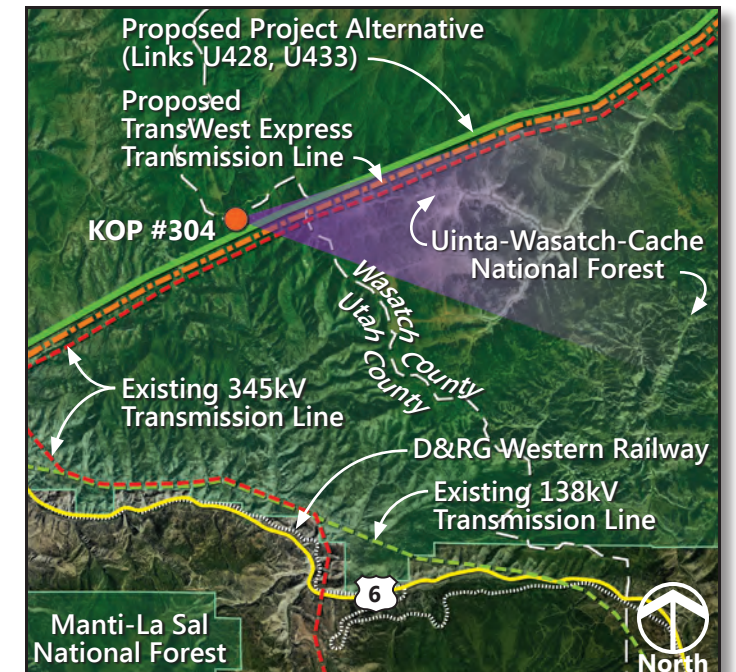
Page H3-66

Photo Date and Time: September 30, 2011, 11:24 a.m. Focal Length: 50mm

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking east from Sheep Creek Road (Forest Road 042) in the Uinta-Wasatch-Cache National Forest



View Location: Approximate distance to proposed transmission line from photo location is 0.4 mile.



Simulated Condition – View of Route Variation COUT-A-1 and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

**KOP #304 – Sheep Creek Road (FR 042)
Cumulative Effects**

DRAFT

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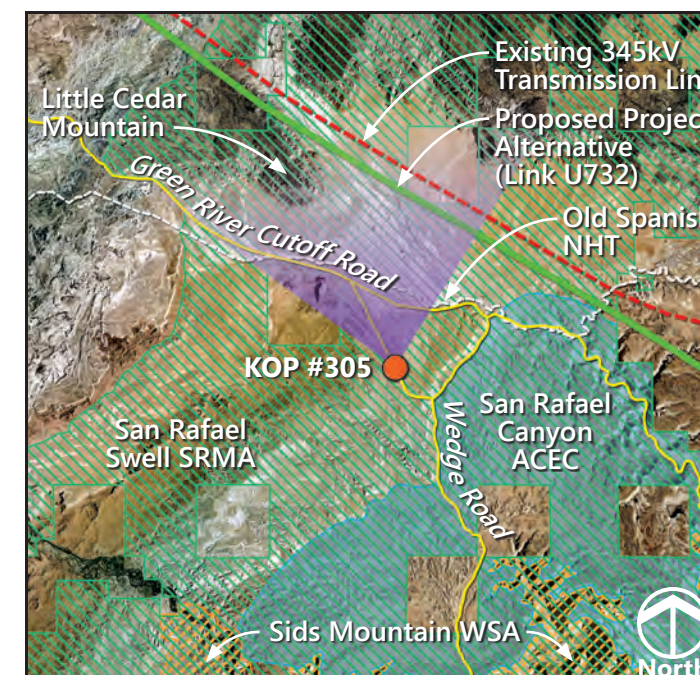
Photo Date and Time: September 30, 2011, 11:24 a.m. Focal Length: 50mm

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



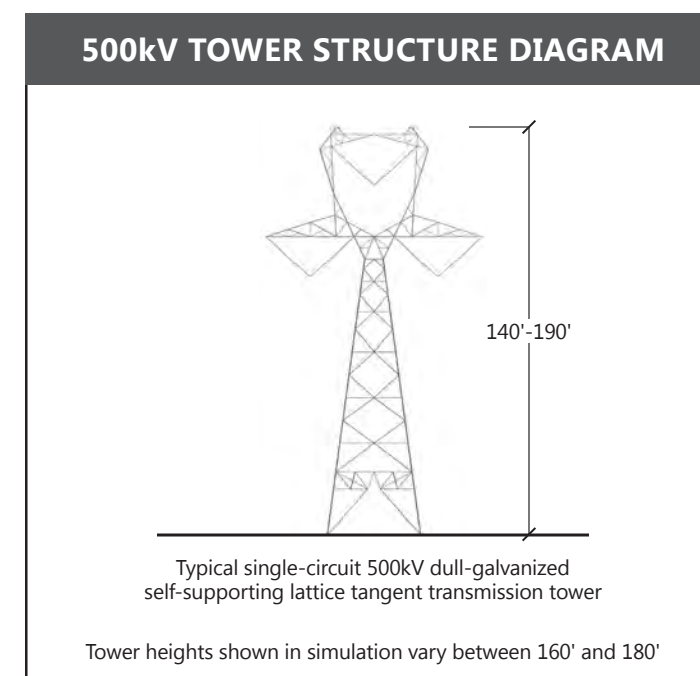
Existing Condition – View looking north from the Wedge Overlook Scenic Backway toward Little Cedar Mountain in BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 1.4 miles.



Simulated Condition – View of Alternatives COUT BAX-B and COUT BAX-C



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KOP #305 – Wedge Overlook Scenic Backway

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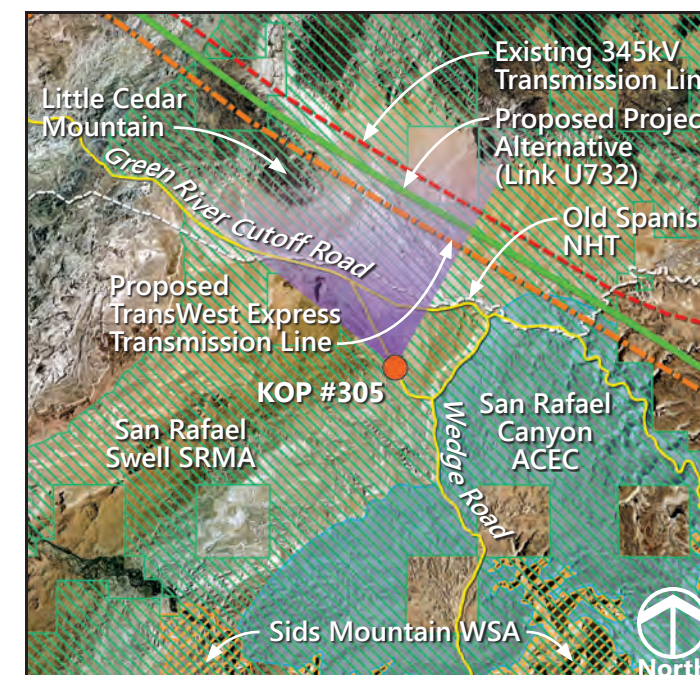
Page H3-68

Photo Date and Time: October 4, 2011, 1:44 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in an 81-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



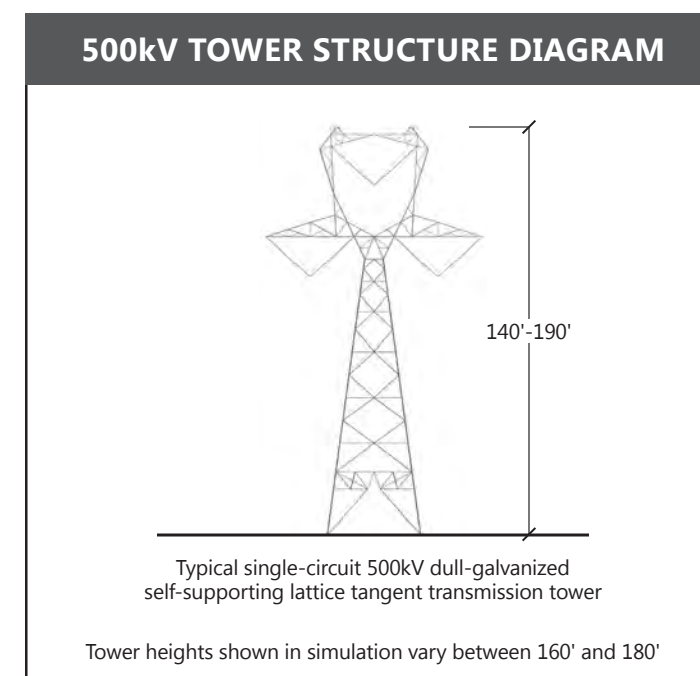
Existing Condition – View looking north from the Wedge Overlook Scenic Backway toward Little Cedar Mountain in BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 1.4 miles.



Simulated Condition – View of Alternatives COUT BAX-B and COUT BAX-C, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #305 – Wedge Overlook Scenic Backway Cumulative Effects

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Photo Date and Time: October 4, 2011, 1:44 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in an 81-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking northwest from the Upper Colorado Scenic Byway toward Interstate 70, an existing railroad, and BLM VRM Class II and III lands



View Location: Approximate distance to proposed transmission line from photo location is 0.6 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #306 – Upper Colorado River Scenic Byway

DRAFT

February 2014

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Photo Date and Time: July 23, 2012, 2:35 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 63-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking northwest from the Upper Colorado Scenic Byway toward Interstate 70, an existing railroad, and BLM VRM Class II and III lands



View Location: Approximate distance to proposed transmission line from photo location is 0.6 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #306 – Upper Colorado River Scenic Byway Cumulative Effects

DRAFT

February 2014

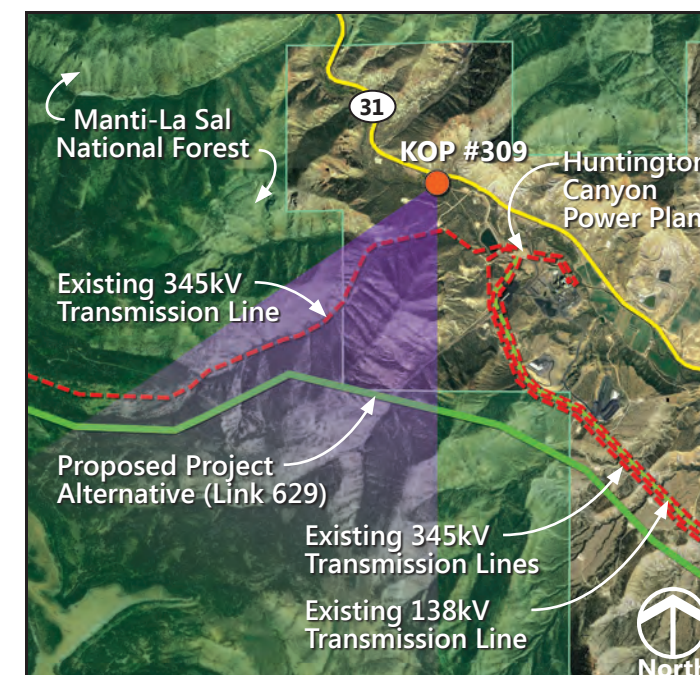
Page H3-71

Photo Date and Time: July 23, 2012, 2:35 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 63-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



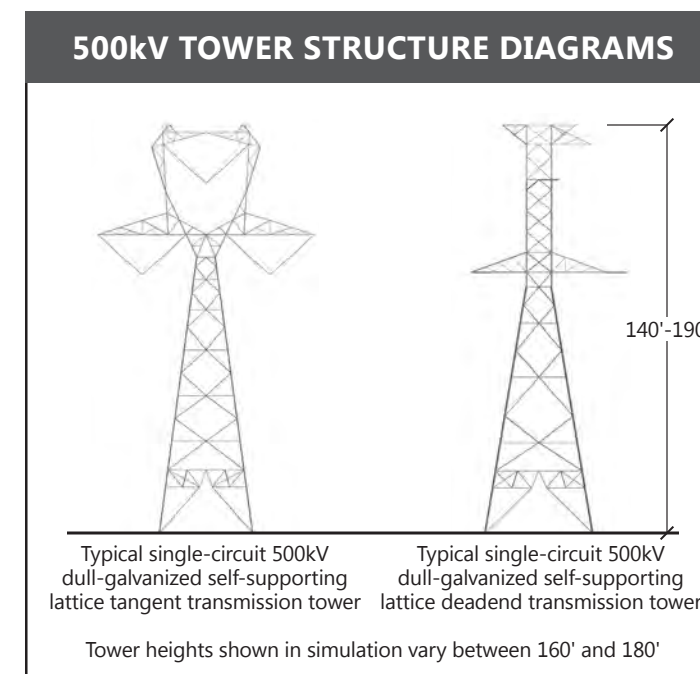
Existing Condition – View looking southwest from Bear Creek Campground, near the Huntington Canyon Power Plant (not visible), toward an existing 345kV transmission line (not visible), and the Manti-La Sal National Forest



View Location: Approximate distance to proposed transmission line from photo location is 2 miles.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT-I



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #309 – Bear Creek Campground

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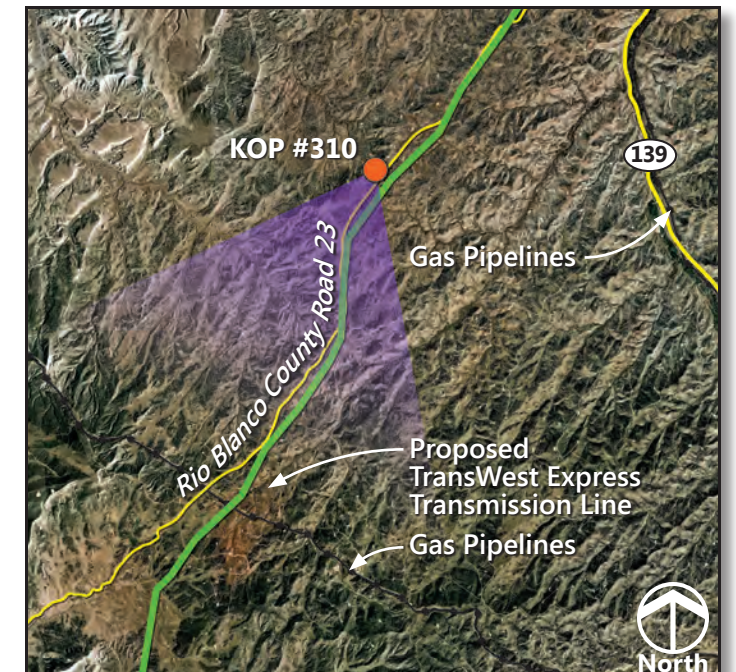
Page H3-72

Photo Date and Time: July 26, 2012, 9:57 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 56-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



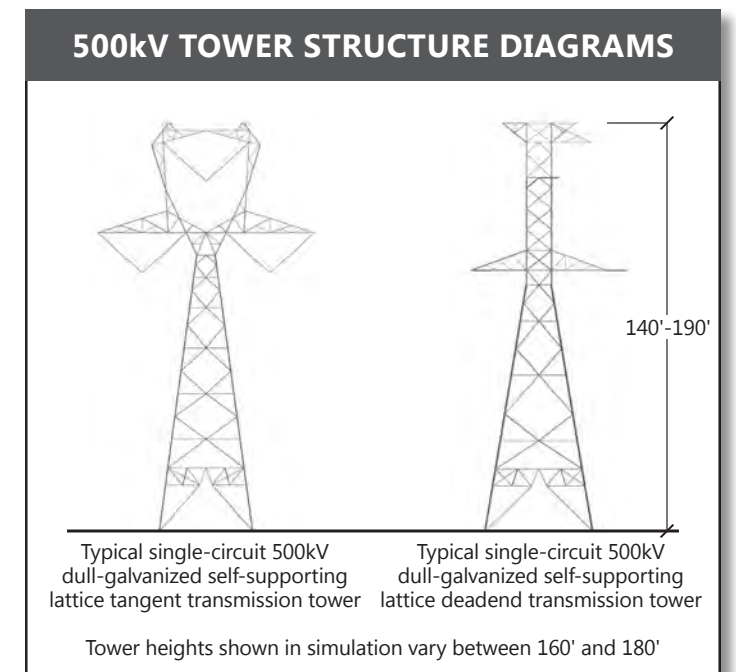
Existing Condition – View looking southwest from the Crook's Brand Rock Art Site toward BLM VRM Class IV lands



View Location: Approximate distance to proposed transmission line from photo location is 0.4 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #310 – Crook's Brand Rock Art Site

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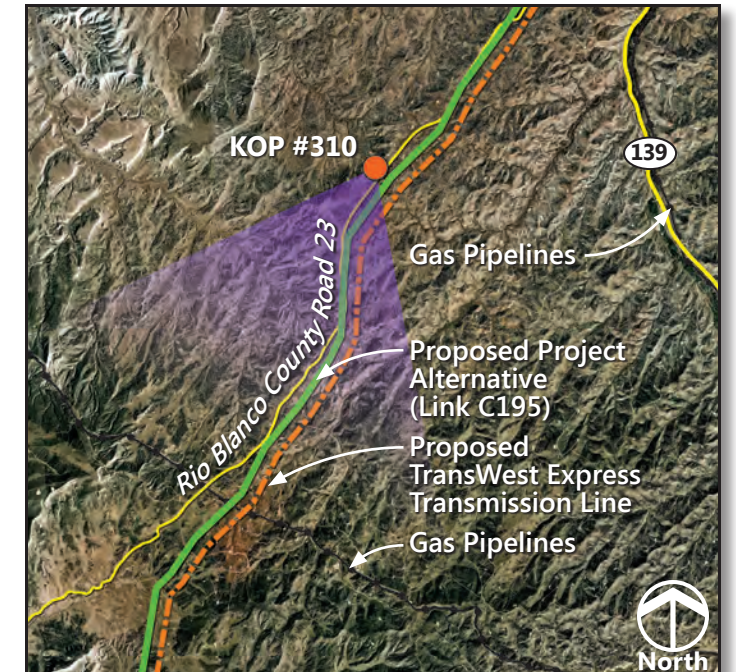
Page H3-73

Photo Date and Time: May 2, 2013, 1:26 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 69-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



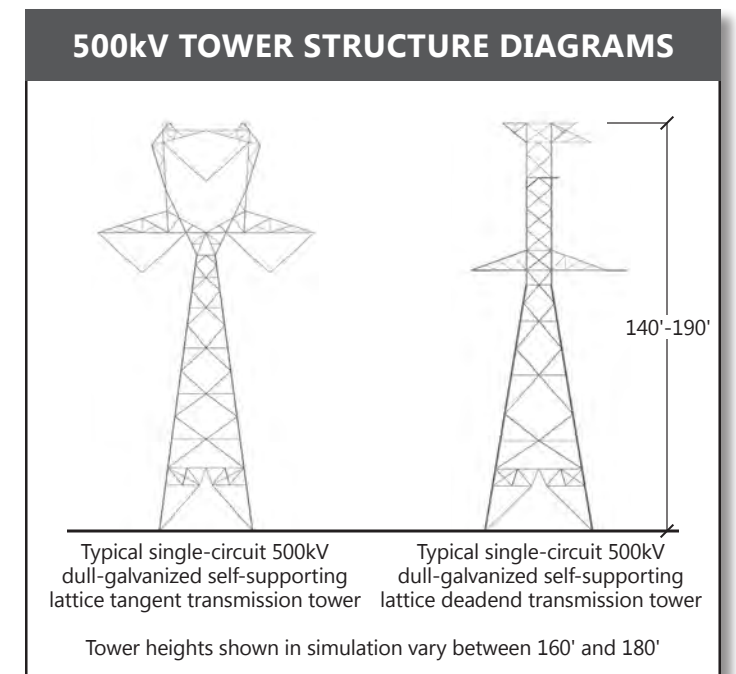
Existing Condition – View looking southwest from the Crook's Brand Rock Art Site toward BLM VRM Class IV lands



View Location: Approximate distance to proposed transmission line from photo location is 0.4 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #310 – Crook's Brand Rock Art Site Cumulative Effects

DRAFT

February 2014

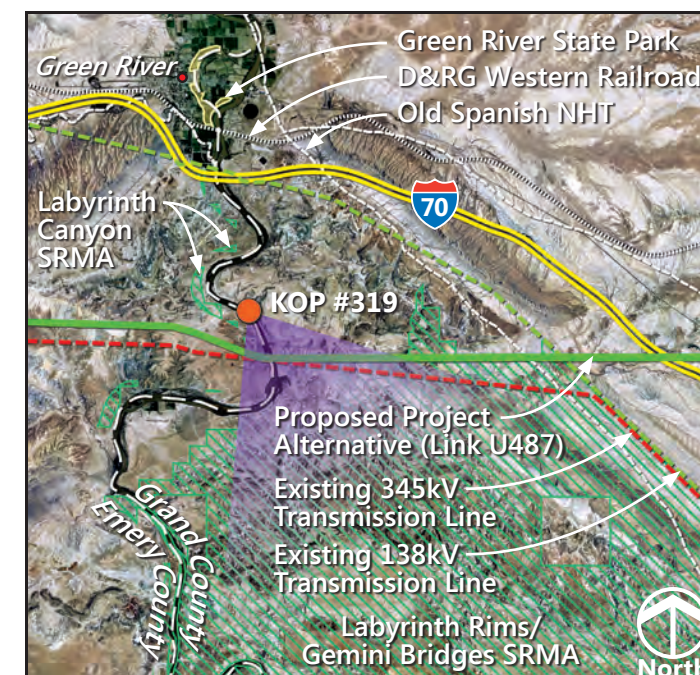
Page H3-74

Photo Date and Time: May 2, 2013, 1:26 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 69-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



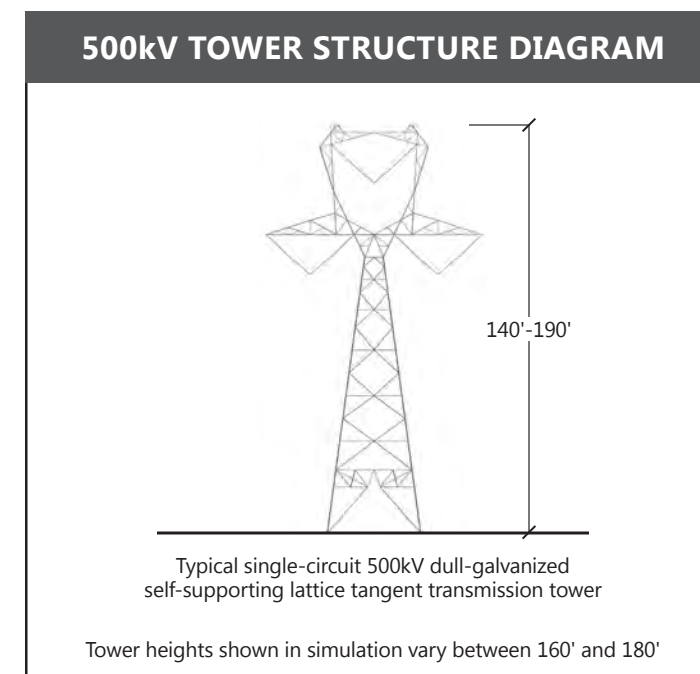
Existing Condition – View looking southeast from Green River toward Crystal Geyser, Labyrinth Rims/Gemini Bridges SRMA, Labyrinth Canyon SRMA, an existing 345kV transmission line, and BLM VRM Class II and III lands



View Location: Approximate distance to proposed transmission line from photo location is 0.7 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #319 – Green River

DRAFT

February 2014

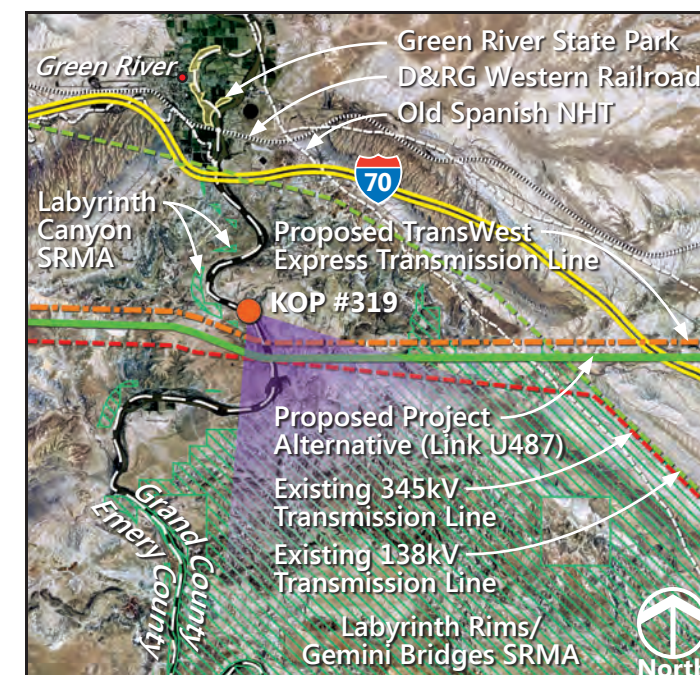
Page H3-75

Photo Date and Time: July 24, 2012, 11:49 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 76-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking southeast from Green River toward Crystal Geyser, Labyrinth Rims/Gemini Bridges SRMA, Labyrinth Canyon SRMA, an existing 345kV transmission line, and BLM VRM Class II and III lands

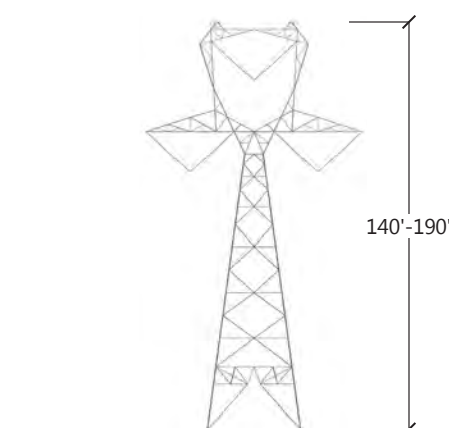


View Location: Approximate distance to proposed transmission line from photo location is 0.7 mile.



Simulated Condition – View of Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E, and the proposed TransWest Express transmission line

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #319 – Green River Cumulative Effects

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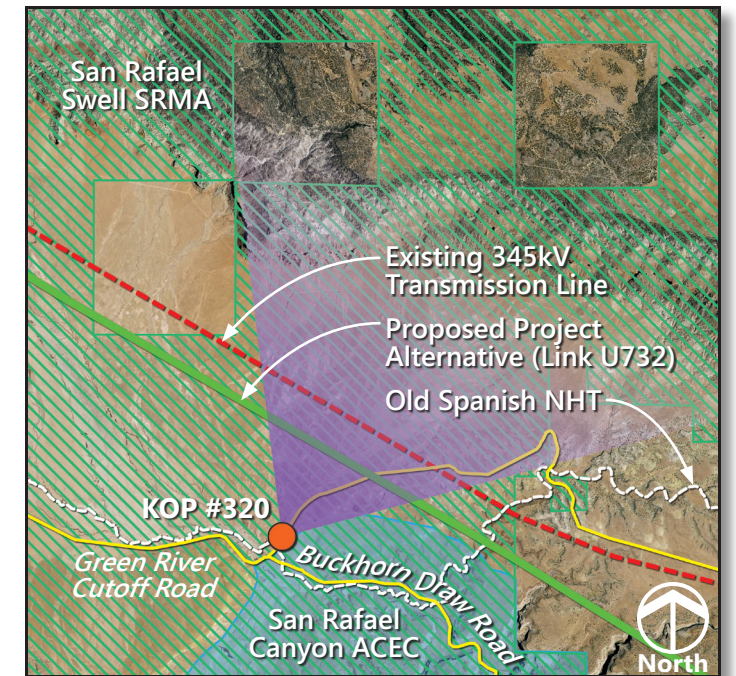
Photo Date and Time: July 24, 2012, 11:49 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 76-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



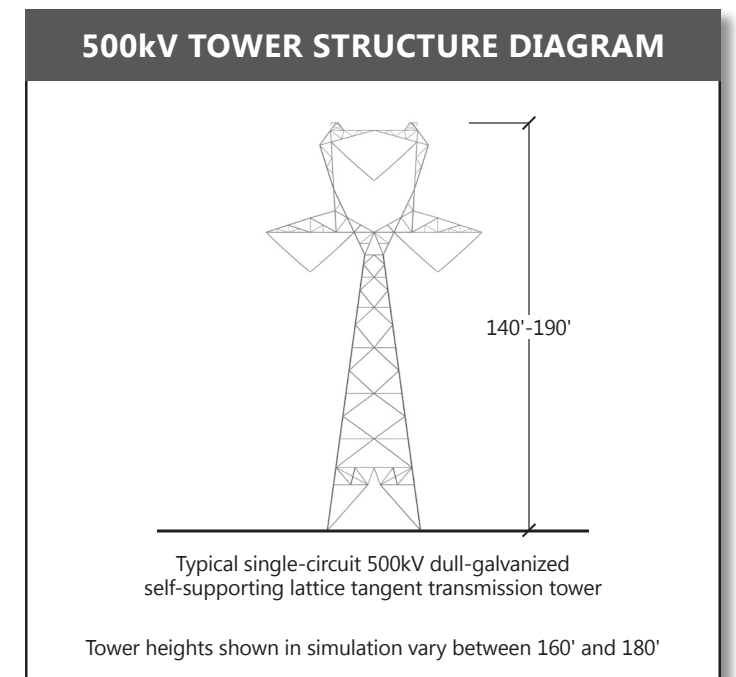
Existing Condition – View looking northeast from Green River Cutoff Road at the intersection of the Buckhorn Draw Scenic Backway, toward an existing 345kV transmission line and BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 0.7 mile.



Simulated Condition – View of Alternative COUT BAX-B and COUT BAX-C



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #320 – Junction of Road to Buckhorn Wash

Photo Date and Time: October 4, 2011, 2:44 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 83-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

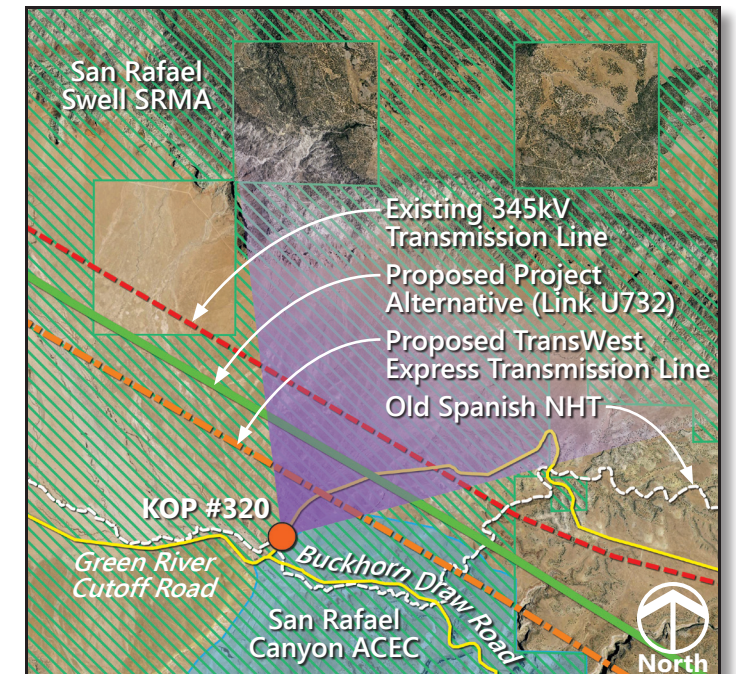
DRAFT

February 2014

Page H3-77



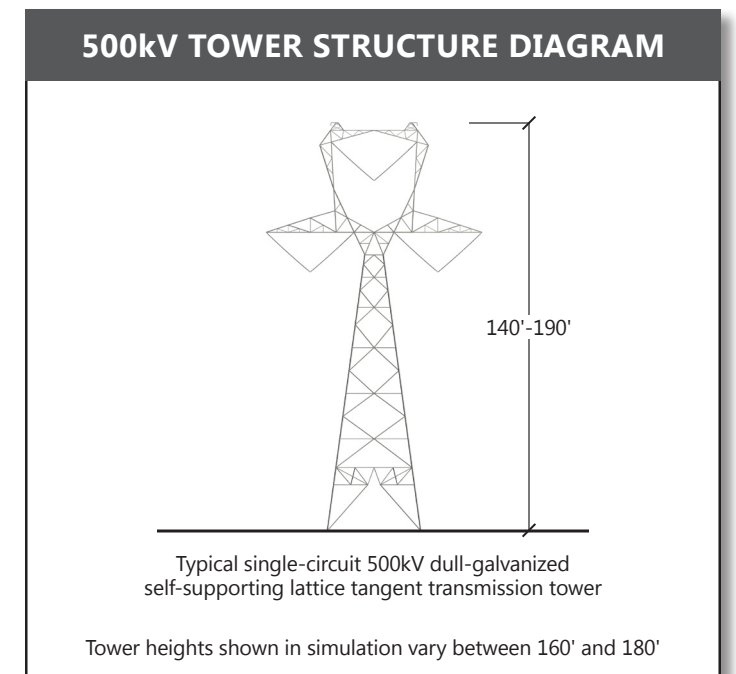
Existing Condition – View looking northeast from Green River Cutoff Road at the intersection of the Buckhorn Draw Scenic Backway, toward an existing 345kV transmission line and BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 0.7 mile.



Simulated Condition – View of Alternative COUT BAX-B and COUT BAX-C, and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #320 – Junction of Road to Buckhorn Wash Cumulative Effects

DRAFT

February 2014

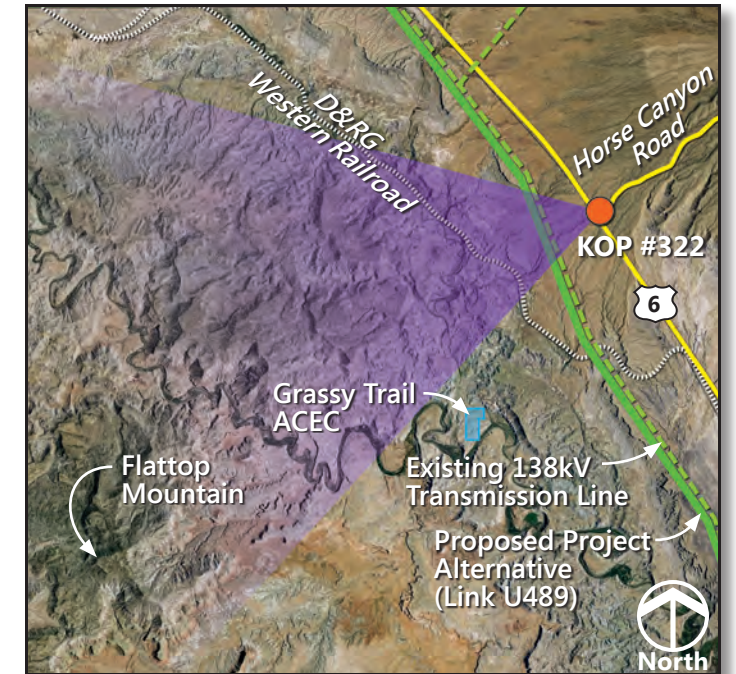
Page H3-78

Photo Date and Time: October 4, 2011, 2:44 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 83-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking west from the Horse Canyon Rest Area east of U.S. Highway 6 toward an existing 138kV transmission line and BLM VRM Class III and IV lands

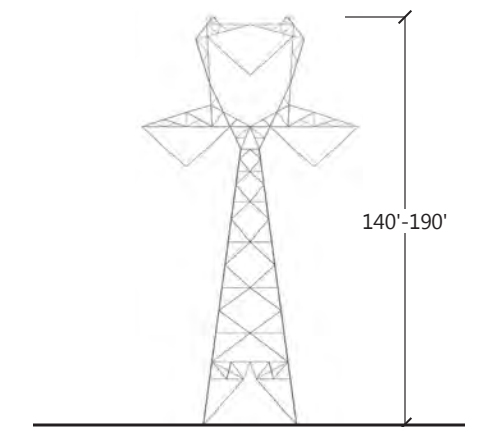


View Location: Approximate distance to proposed transmission line from photo location is 1.0 mile.



Simulated Condition – View of Alternative COUT BAX-E

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #322 – U.S. Highway 6 Rest Area

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February 2014

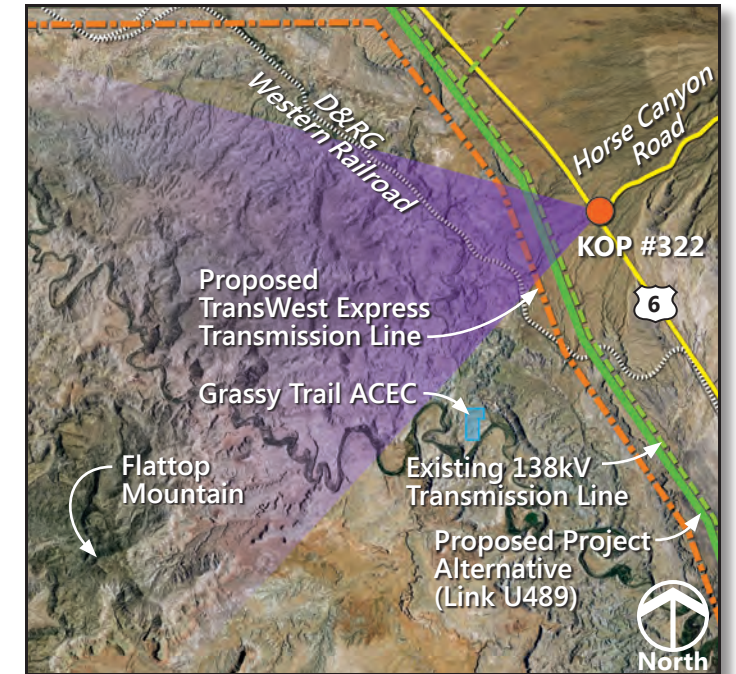
Page H3-79

Photo Date and Time: July 23, 2012, 11:54 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 59-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



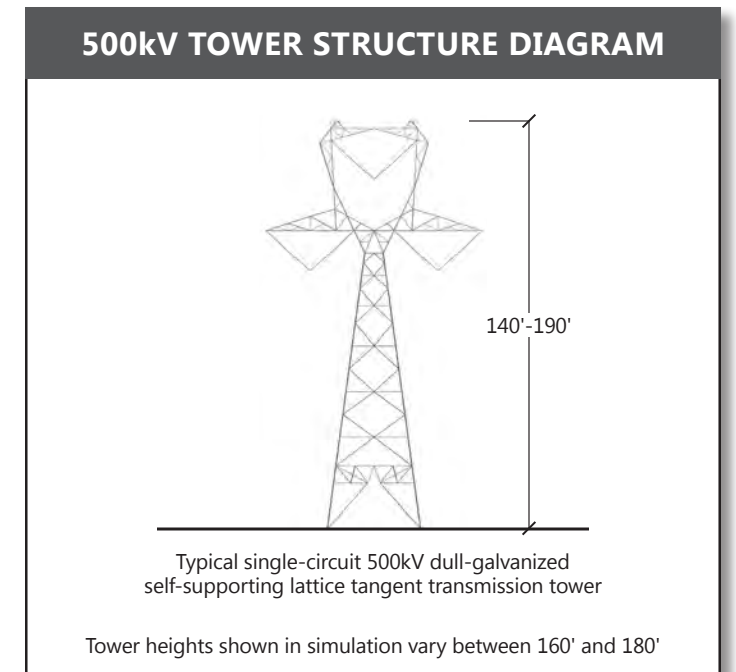
Existing Condition – View looking west from the Horse Canyon Rest Area east of U.S. Highway 6 toward an existing 138kV transmission line and BLM VRM Class III and IV lands



View Location: Approximate distance to proposed transmission line from photo location is 1.0 mile.



Simulated Condition – View of Alternative COUT BAX-E and proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #322 – U.S. Highway 6 Rest Area Cumulative Effects

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February 2014

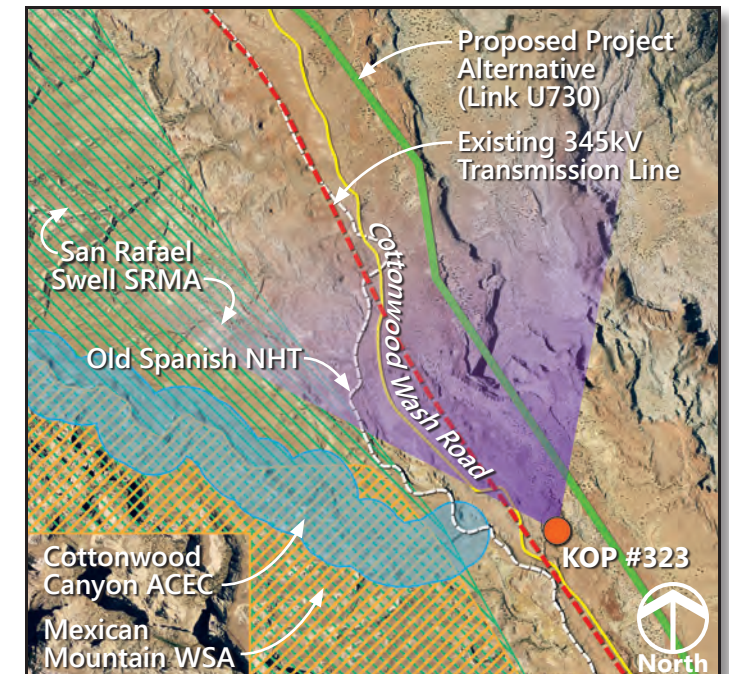
Page H3-80

Photo Date and Time: July 23, 2012, 11:54 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 59-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



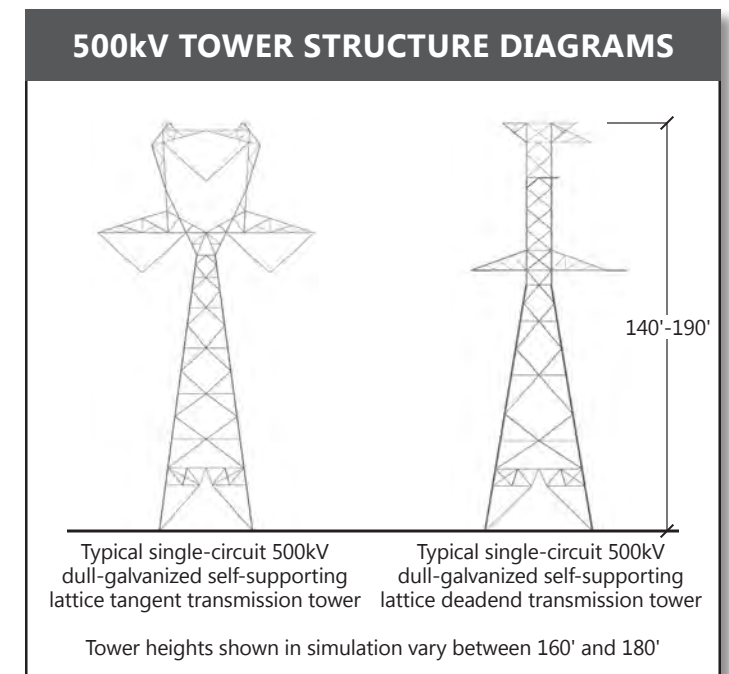
Existing Condition – View looking northwest from Cottonwood Wash Road (Old Railroad Grade) toward an existing 345kV transmission line in BLM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 0.3 mile.



Simulated Condition – View of Alternative COUT BAX-B



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KOP #323 – Old Railroad Grade

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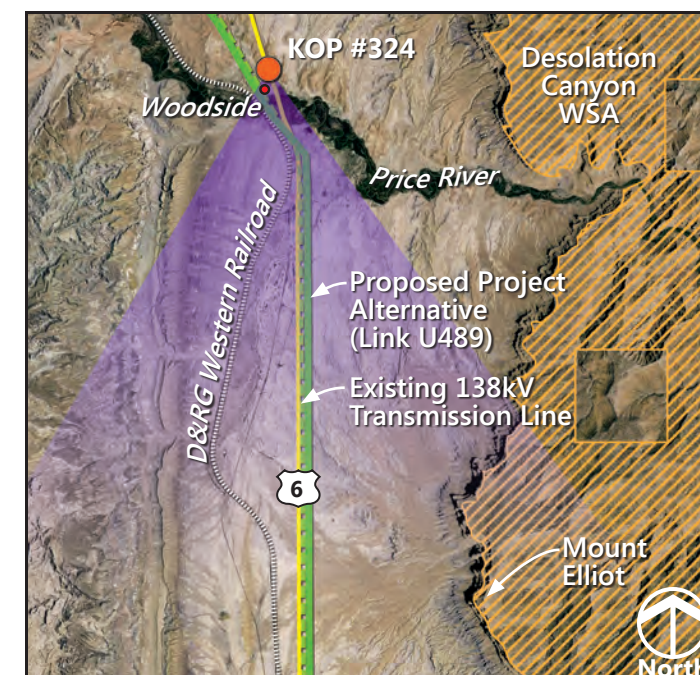
Page H3-81

Photo Date and Time: October 12, 2011, 9:38 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 73-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



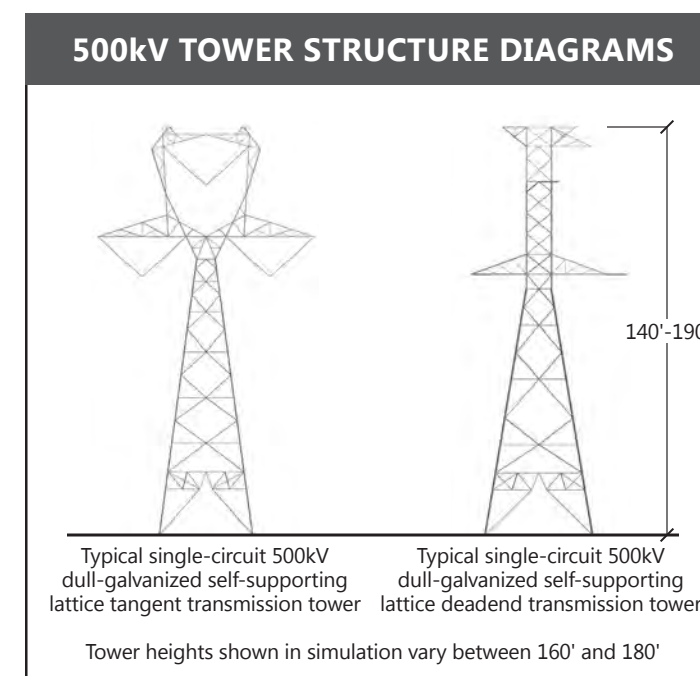
Existing Condition – View looking south from U.S. Highway 6, north of Woodside, Utah, toward the Price River, an existing 138kV transmission line, Mount Elliot, and BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 0.3 mile.



Simulated Condition – View of Alternative COUT BAX-E



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #324 – U.S. Highway 6
North of Woodside

Photo Date and Time: July 23, 2012, 12:21 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 66-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

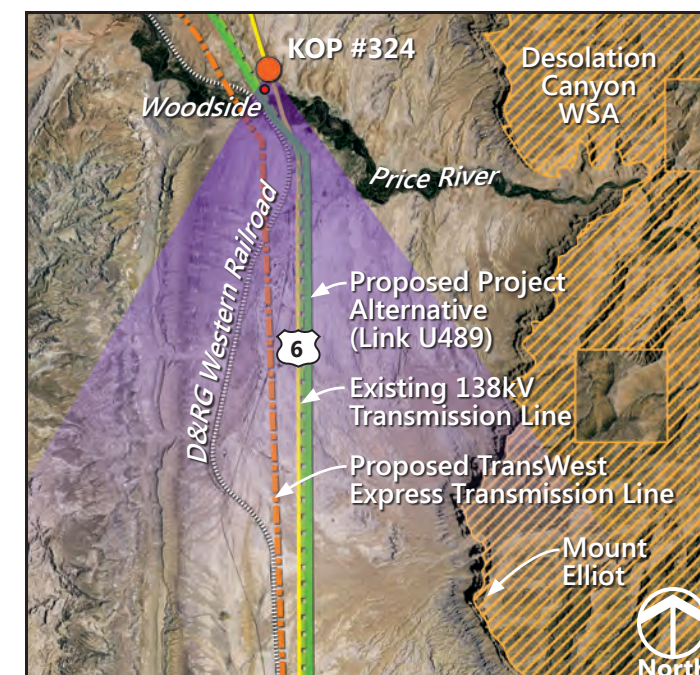
DRAFT

February 2014

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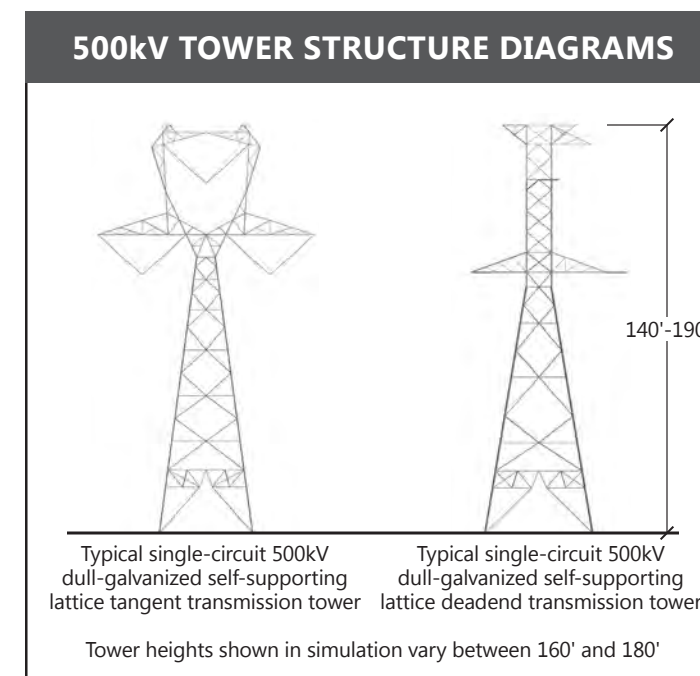
Existing Condition – View looking south from U.S. Highway 6, north of Woodside, Utah, toward the Price River, an existing 138kV transmission line, Mount Elliot, and BLM VRM Class III lands



View Location: Approximate distance to proposed transmission line from photo location is 0.3 mile.



Simulated Condition – View of Alternative COUT BAX-E and the proposed TransWest Express transmission line



Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #324 – U.S. Highway 6
North of Woodside
Cumulative Effects

DRAFT

February 2014

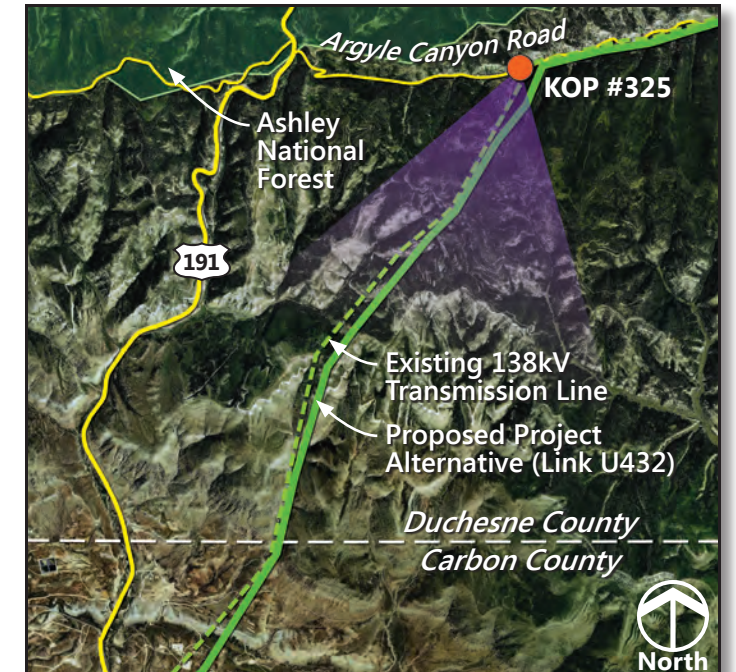
Page H3-83

Photo Date and Time: July 23, 2012, 12:21 p.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 66-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design. Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.



Existing Condition – View looking southeast from dispersed residences along Argyle Canyon Road

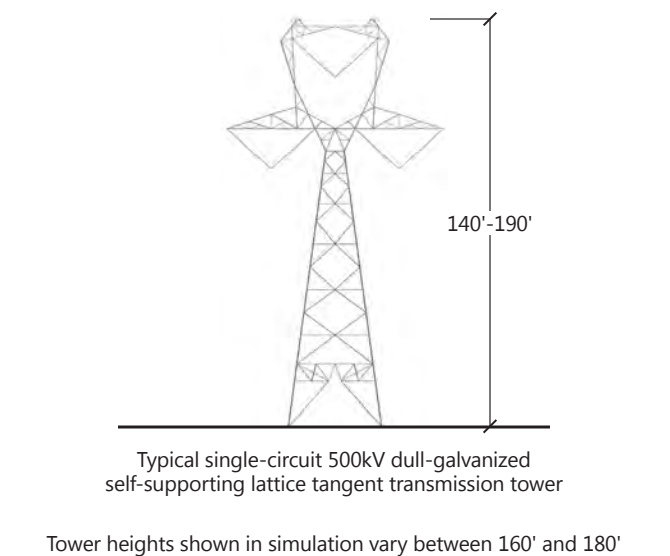


View Location: Approximate distance to proposed transmission line from photo location is 0.3 mile.



Simulated Condition – View of Alternative COUT-B (and route variations)

500kV TOWER STRUCTURE DIAGRAM



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KOP #325 – Argyle Canyon Residences

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Photo Date and Time: September 28, 2011, 10:07 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 67-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking south from U.S. Highway 191, south of Argyle Canyon Road, at the edge of the Ashley National Forest

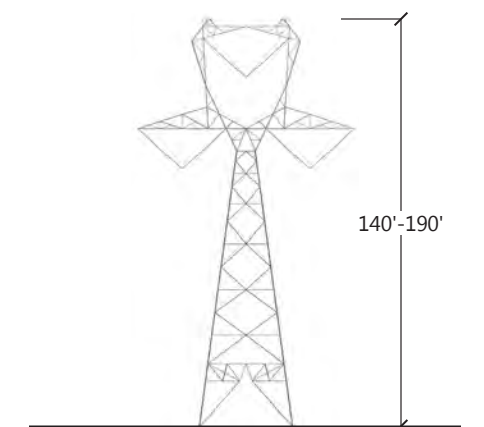


View Location: Approximate distance to proposed transmission line from photo location is 0.2 mile.



Simulated Condition – View of Route Variations COUT-A-1 and COUT-B-1

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #328 – Indian Canyon Scenic Byway (U.S. Highway 191) north of Emma Park

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Photo Date and Time: August 21, 2013, 10:19 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 66-degree field of view)

Simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.



Existing Condition – View looking south from U.S. Highway 191, south of Argyle Canyon Road, at the edge of the Ashley National Forest

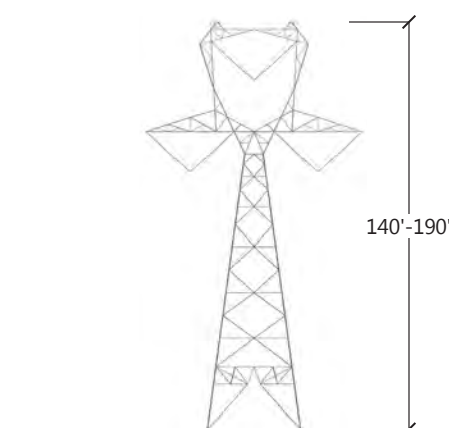


View Location: Approximate distance to proposed transmission line from photo location is 0.2 mile.



Simulated Condition – View of Route Variations COUT-A-1 and COUT-B-1 and the proposed TransWest Express transmission line

500kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500kV dull-galvanized self-supporting lattice tangent transmission tower

Tower heights shown in simulation vary between 160' and 180'

Draft EIS and LUPAs for the Energy Gateway South Transmission Project

KOP #328 – Indian Canyon Scenic Byway (U.S. Highway 191) north of Emma Park
Cumulative Effects

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Photo Date and Time: August 21, 2013, 10:19 a.m. Focal Length: 50mm
(The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in a 66-degree field of view)

Energy Gateway South simulations were prepared using three-dimensional tower models provided by Rocky Mountain Power. Typical towers would range between 140 to 190 feet above ground with a span of 1,200 feet. Tower locations and heights may differ based on final engineering and design.

Cumulative effect simulations depicting the proposed TransWest Express project are conceptual and shown for reference only.

APPENDIX I – PROGRAMMATIC AGREEMENT

I.1 Introduction

A copy of the executed Programmatic Agreement will be inserted in the Final Environmental Impact Statement.

The Bureau of Land Management (BLM), in consultation with the State Historic Preservation Offices (SHPOs) of Wyoming, Colorado, and Utah, agreed to develop a Programmatic Agreement among the various state and federal agencies and consulting parties with an interest in the Energy Gateway South Transmission Project (Project). A Programmatic Agreement records the terms and conditions agreed upon to resolve the potential adverse effects of a complex undertaking in accordance with 36 Code of Federal Regulations 800.14(b). The Programmatic Agreement outlines the stipulations that would be followed concerning the identification, assessment, and treatment of cultural resources for the Project. Signatories agree that the Project will be administered in accordance with the stipulations set forth in the Programmatic Agreement. To date, the signatory parties include the BLM; U.S. Forest Service; National Park Service; and SHPOs of Wyoming, Colorado, and Utah. Additional signatory parties, invited signatory parties (e.g., PacifiCorp [doing business as Rocky Mountain Power, the Applicant]), and concurring parties have yet to be determined. Tribal consultation has been initiated with 33 tribes and the BLM has invited all of these tribes to participate as concurring parties to the Programmatic Agreement.

APPENDIX J – CALCULATED ELECTRIC FIELDS, MAGNETIC FIELDS, AUDIBLE NOISE LEVELS, AND RADIO NOISE LEVELS

Appendix J contains diagrams (Figures J-1 through J-16) and tables (Tables J-1 through J-10) referenced in Chapter 3, Section 3.2.21, Public Health and Safety. Diagrams illustrate calculated profiles for electric fields, magnetic fields, audible noise, and radio noise modeled for four locations (modeled cross sections 1 to 4). The diagrams represent the existing and proposed transmission line configurations on the alternative routes analyzed in this document. Tables J-1 to J-10 identify calculated magnetic field levels for average- and peak-load conditions, electric-field levels, and audible noise for the modeled cross sections.

J.1 Magnetic Field Profiles

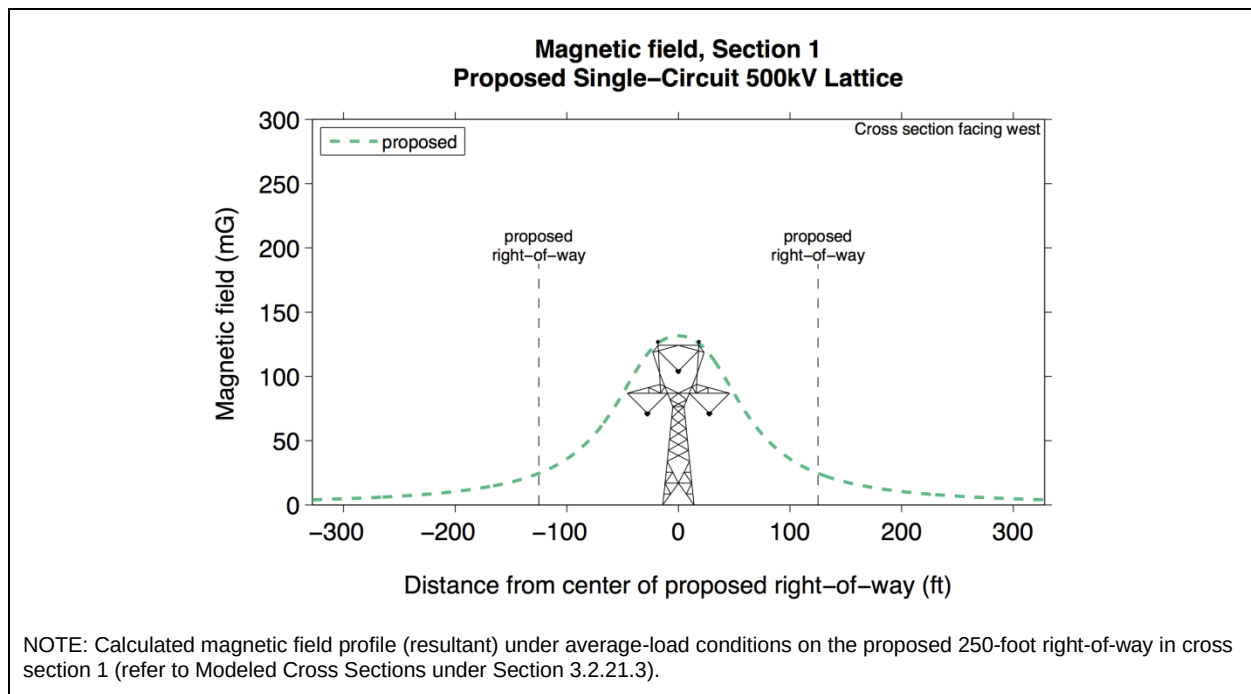


Figure J-1 **Calculated Magnetic Field, Average Load in Cross Section 1**

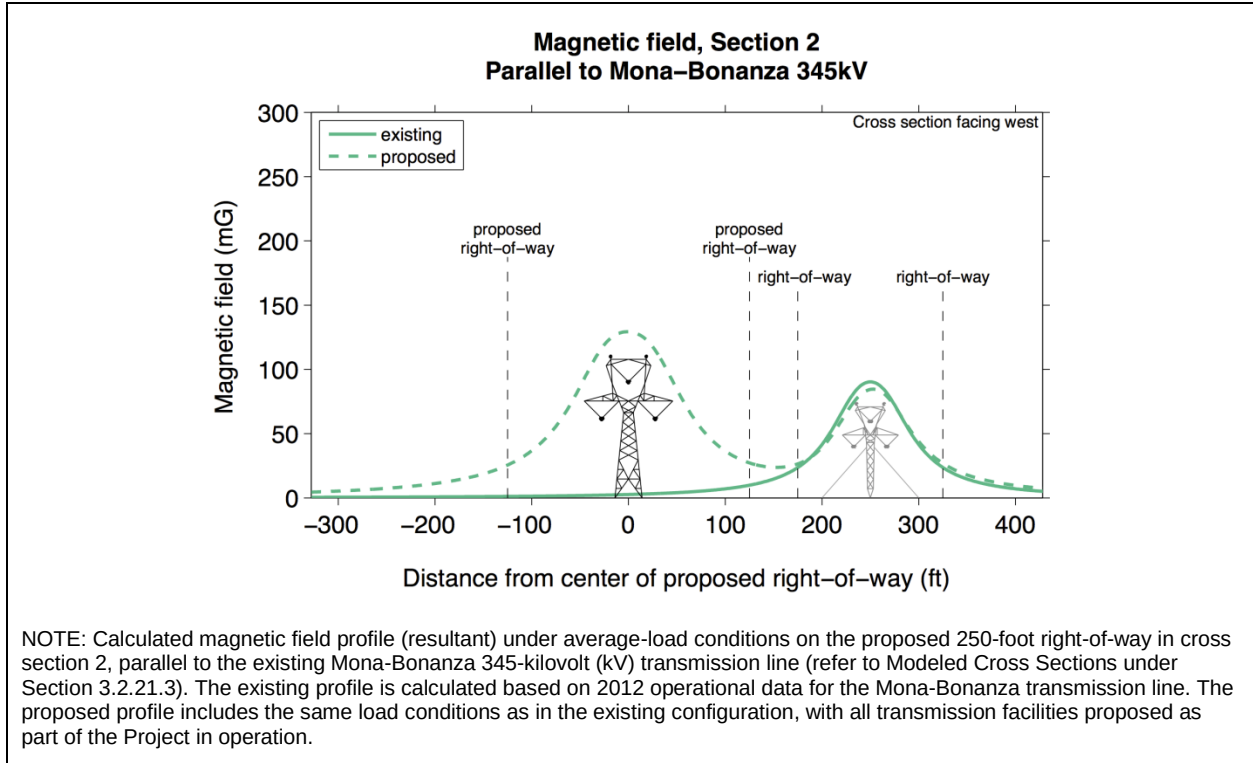


Figure J-2 Calculated Magnetic Field, Average Load in Cross Section 2

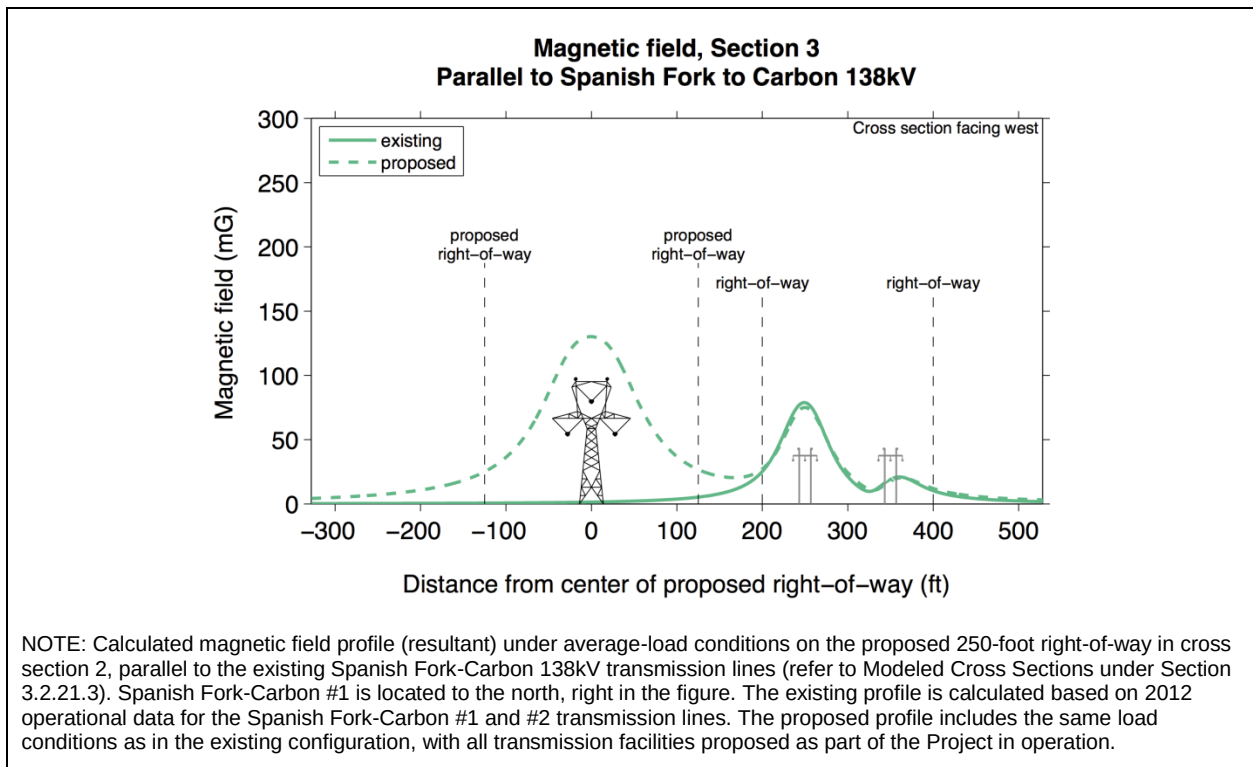


Figure J-3 Calculated Magnetic Field, Average Load in Cross Section 3

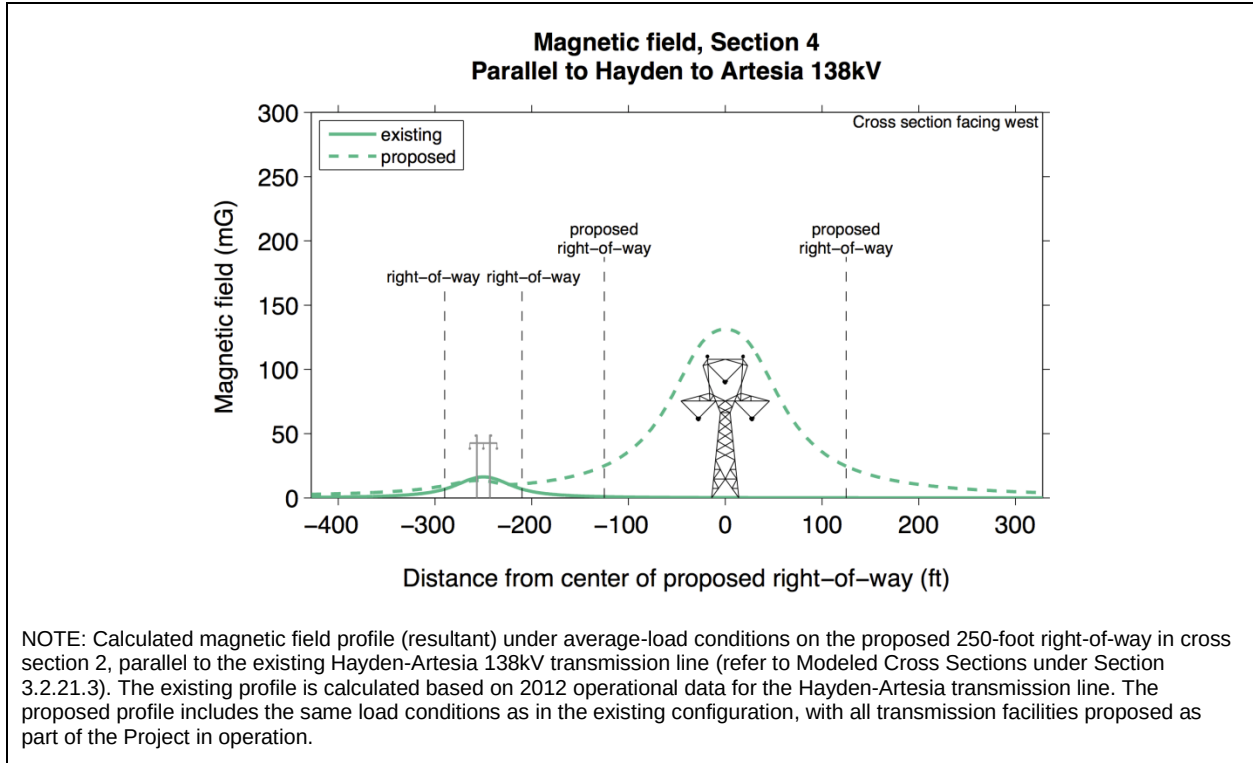


Figure J-4 Calculated Magnetic Field, Average Load in Cross Section 4

J.2 Electric Field Profiles

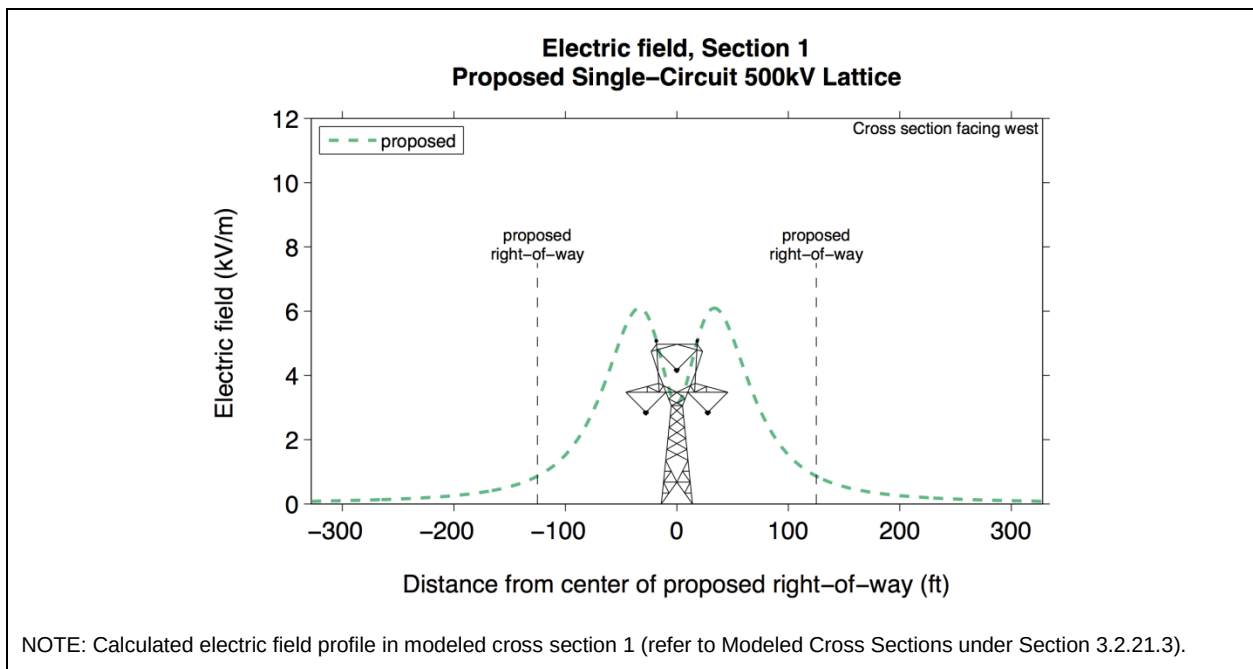


Figure J-5 Calculated Electric Field in Cross Section 1

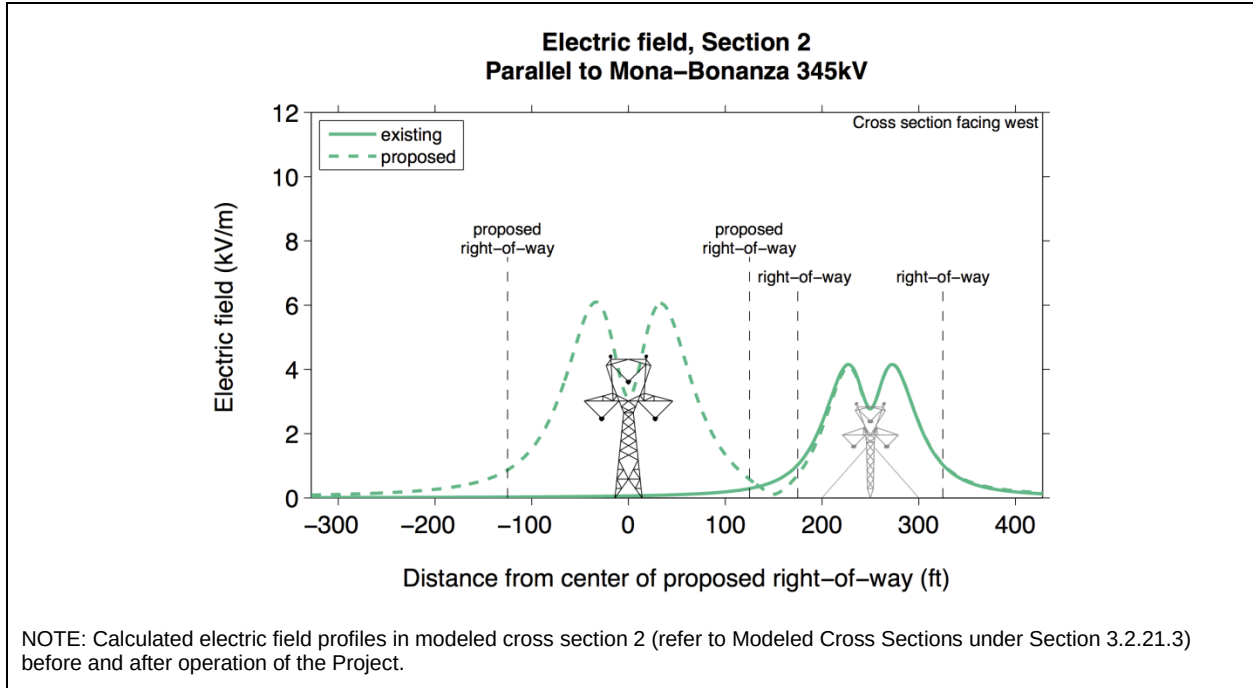


Figure J-6 Calculated Electric Field in Cross Section 2

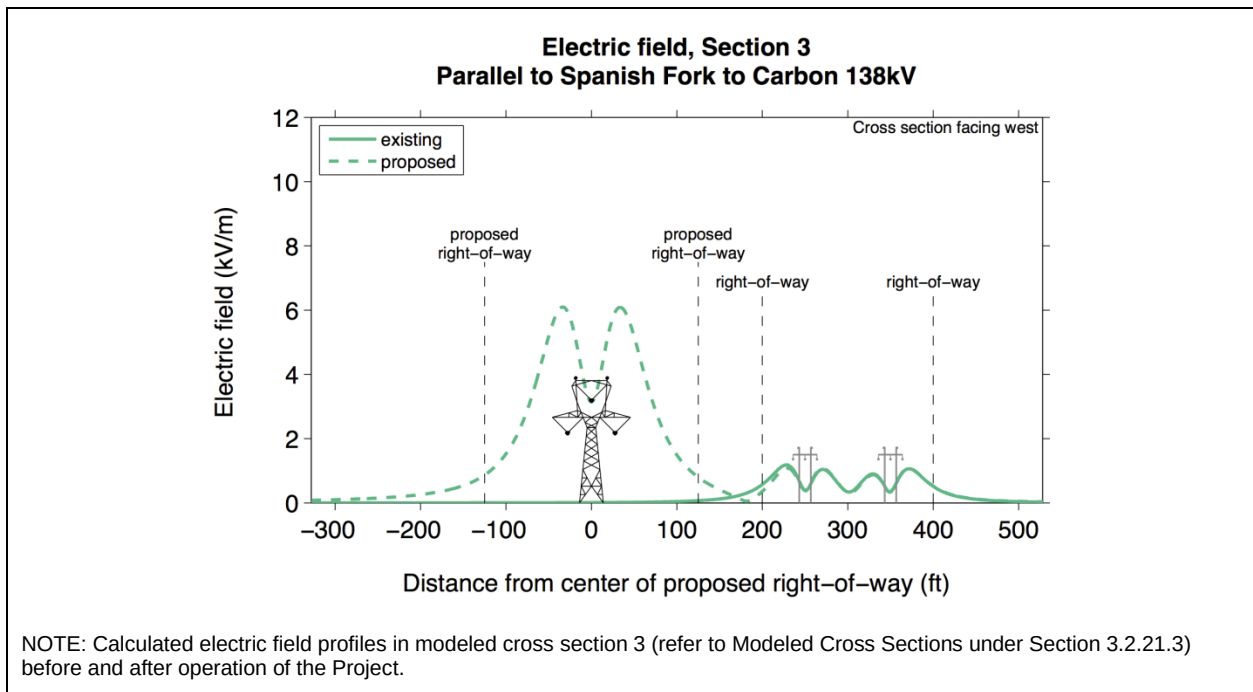


Figure J-7 Calculated Electric Field in Cross Section 3

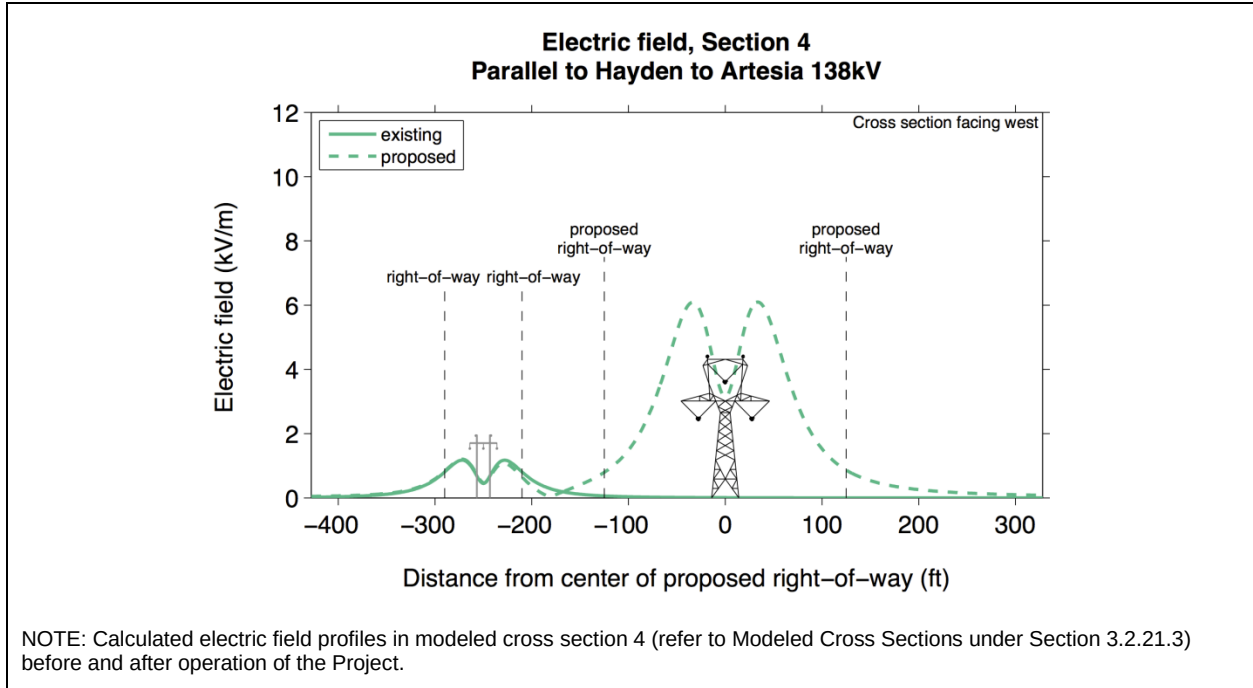


Figure J-8 Calculated Electric Field in Cross Section 4

J.3 Audible Noise Profiles

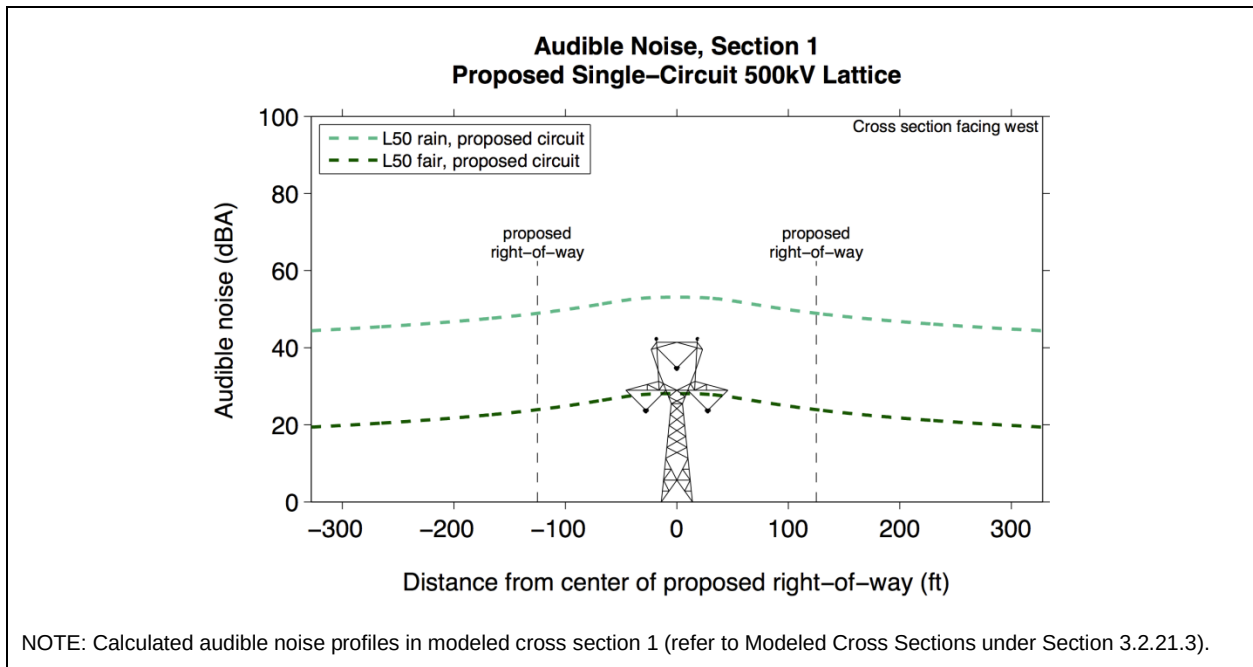


Figure J-9 Calculated Audible Noise in Cross Section 1

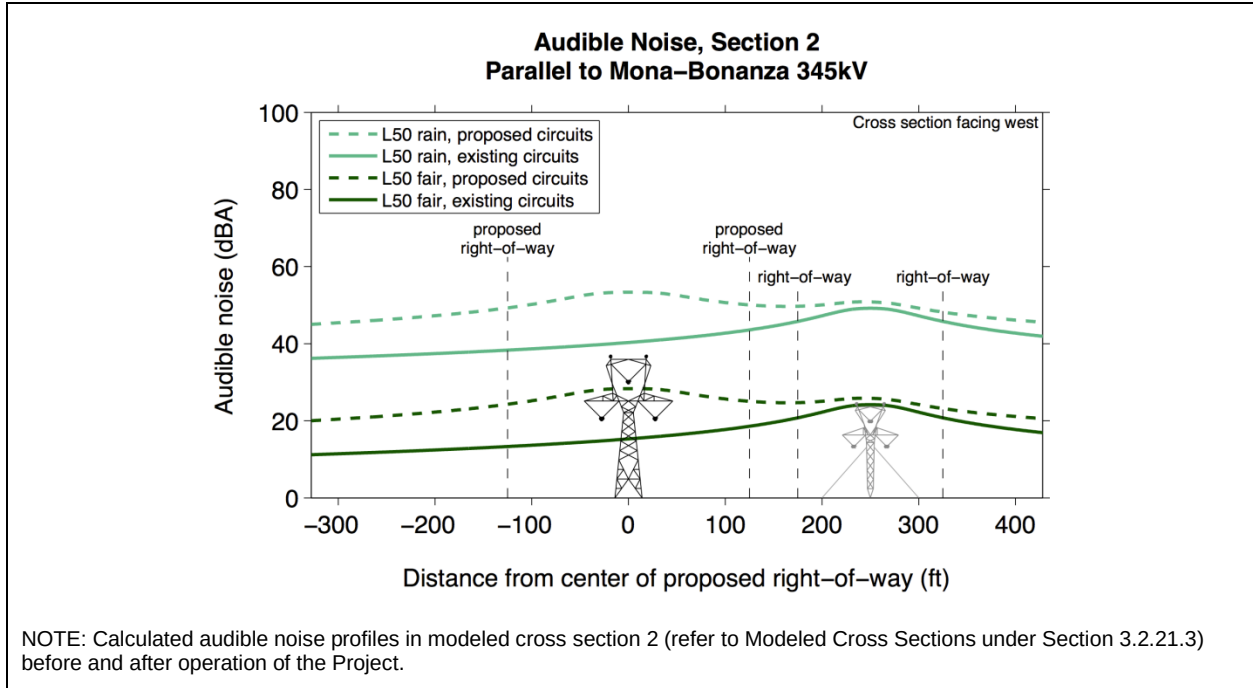


Figure J-10 Calculated Audible Noise in Cross Section 2

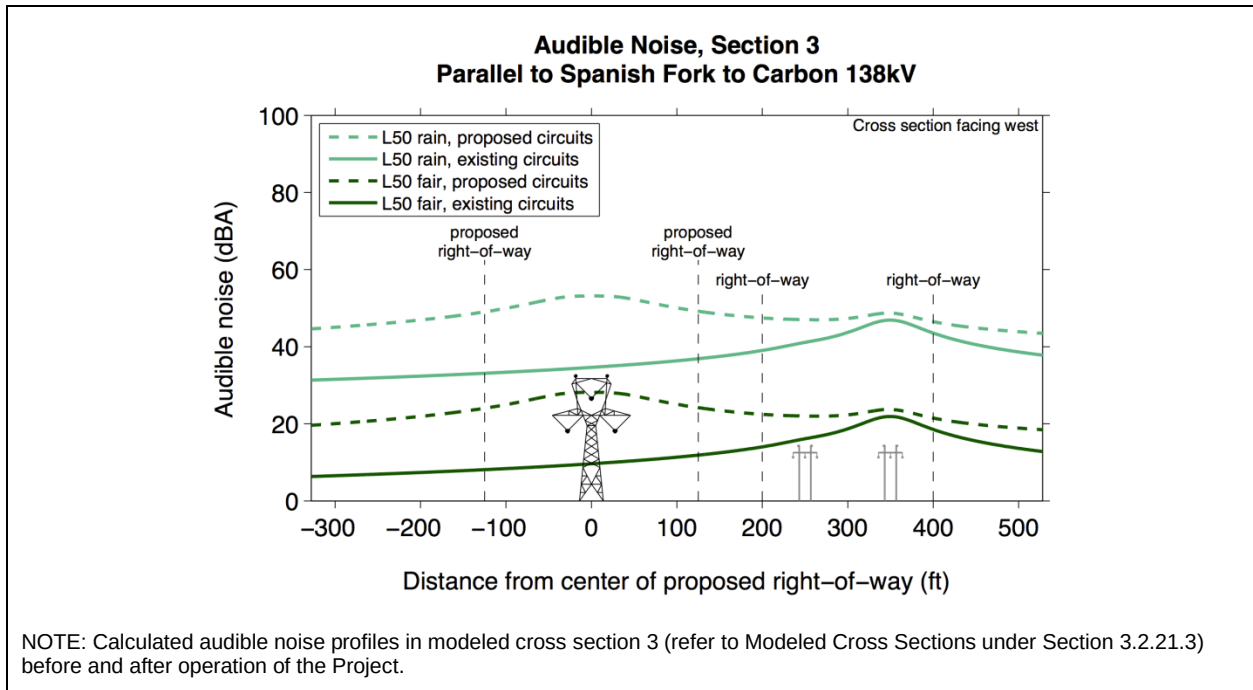


Figure J-11 Calculated Audible Noise in Cross Section 3

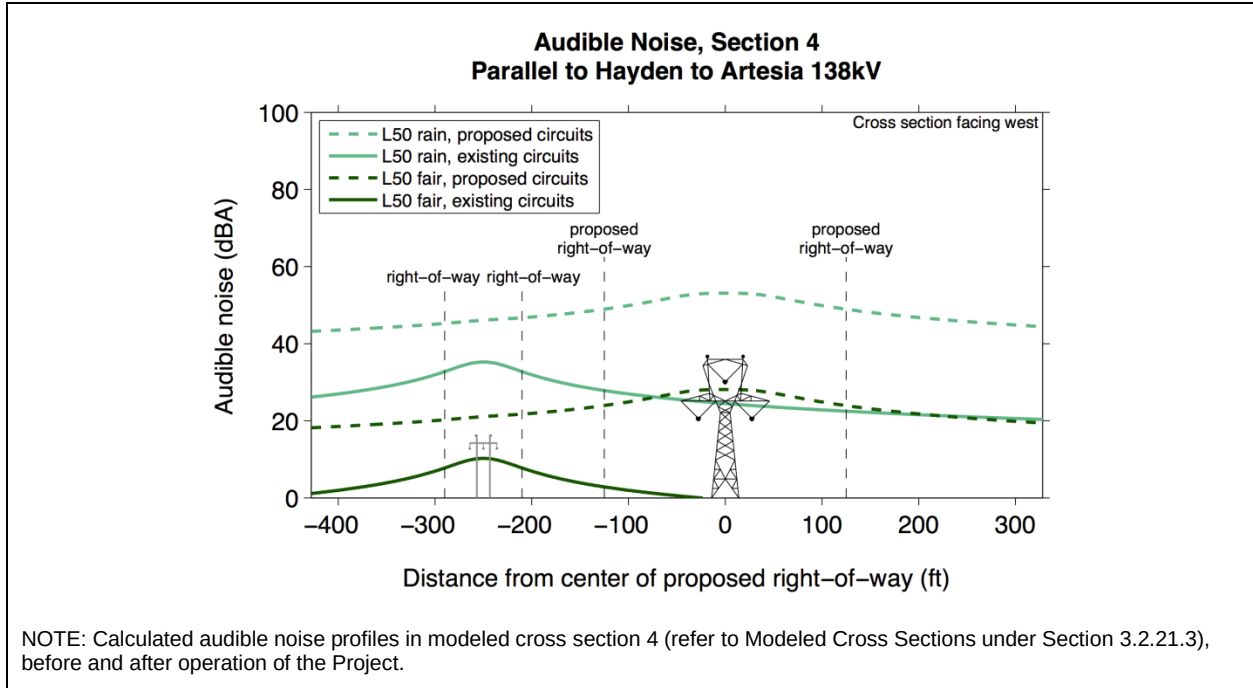


Figure J-12 Calculated Audible Noise in Cross Section 4

J.4 Radio Noise Profiles

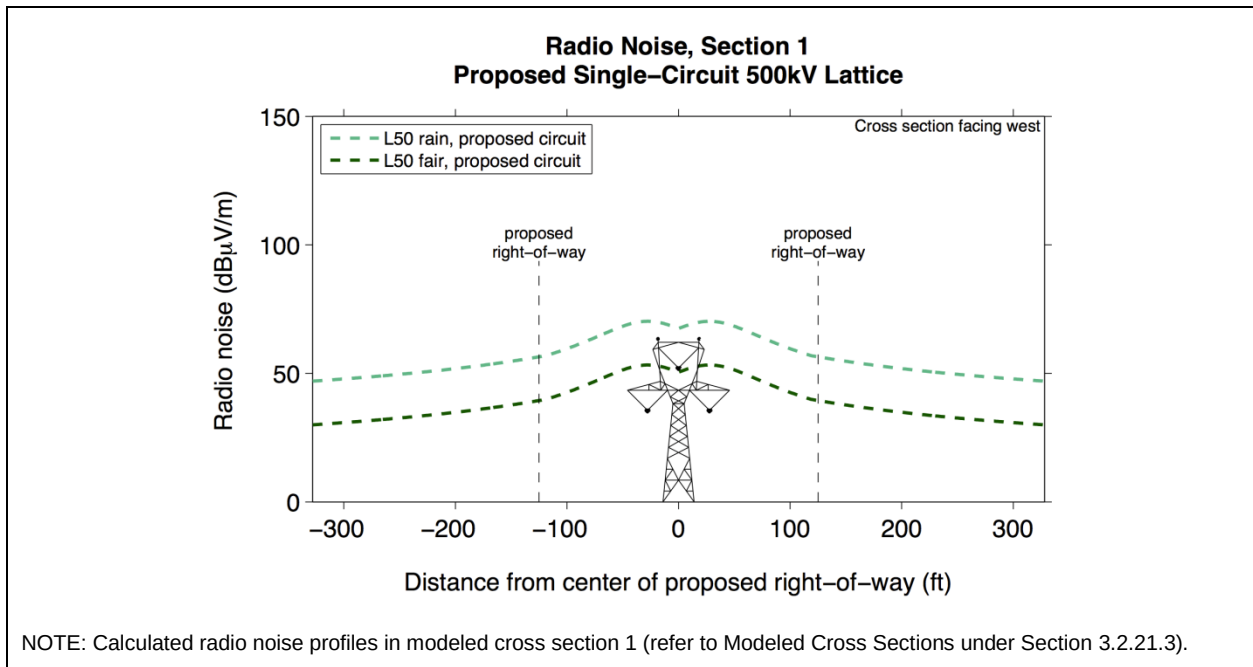


Figure J-13 Calculated Radio Noise in Cross Section 1

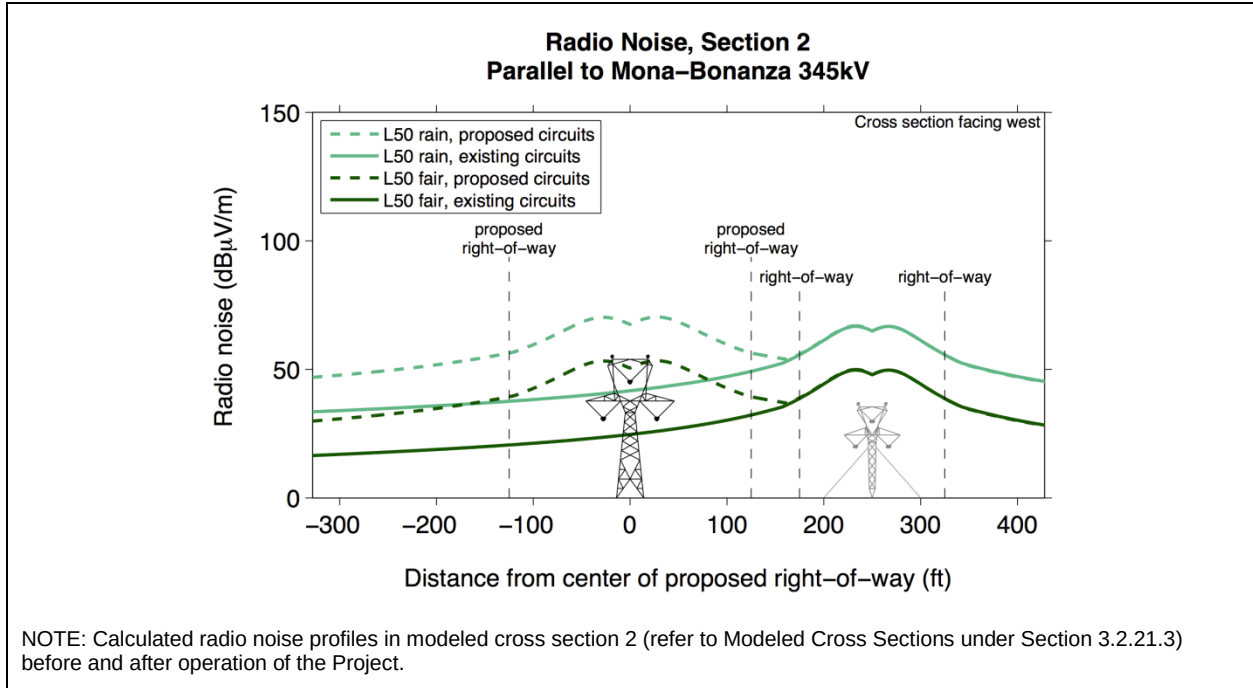


Figure J-14 Calculated Radio Noise in Cross Section 2

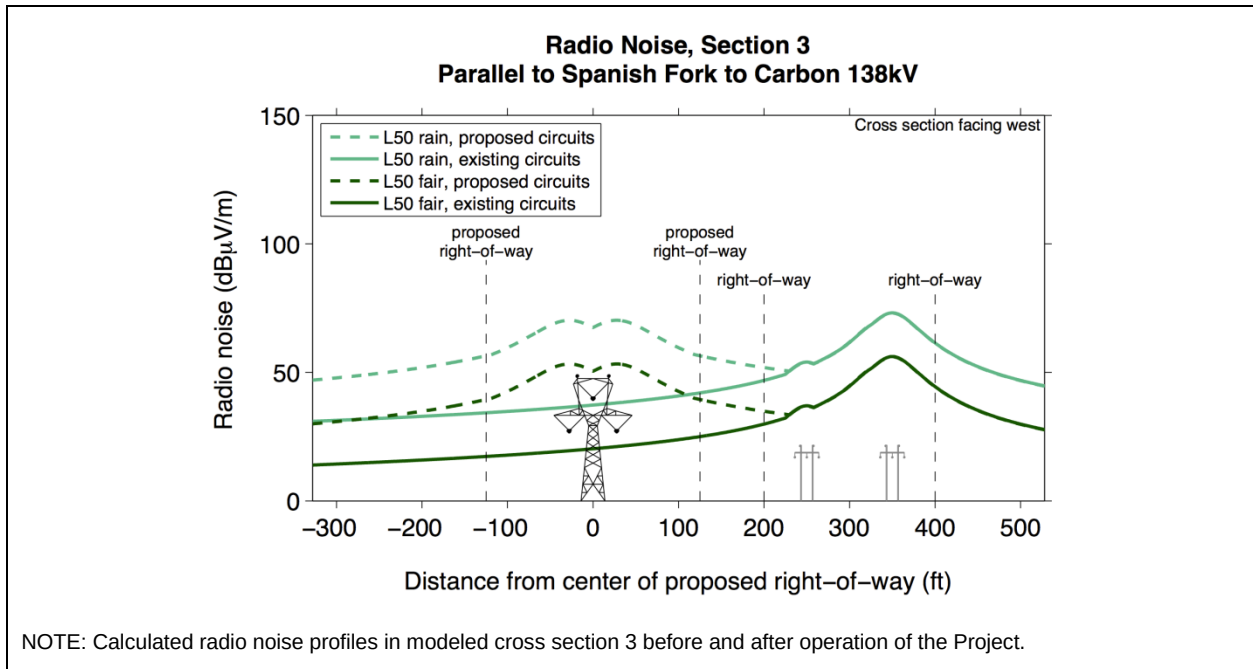


Figure J-15 Calculated Radio Noise in Cross Section 3

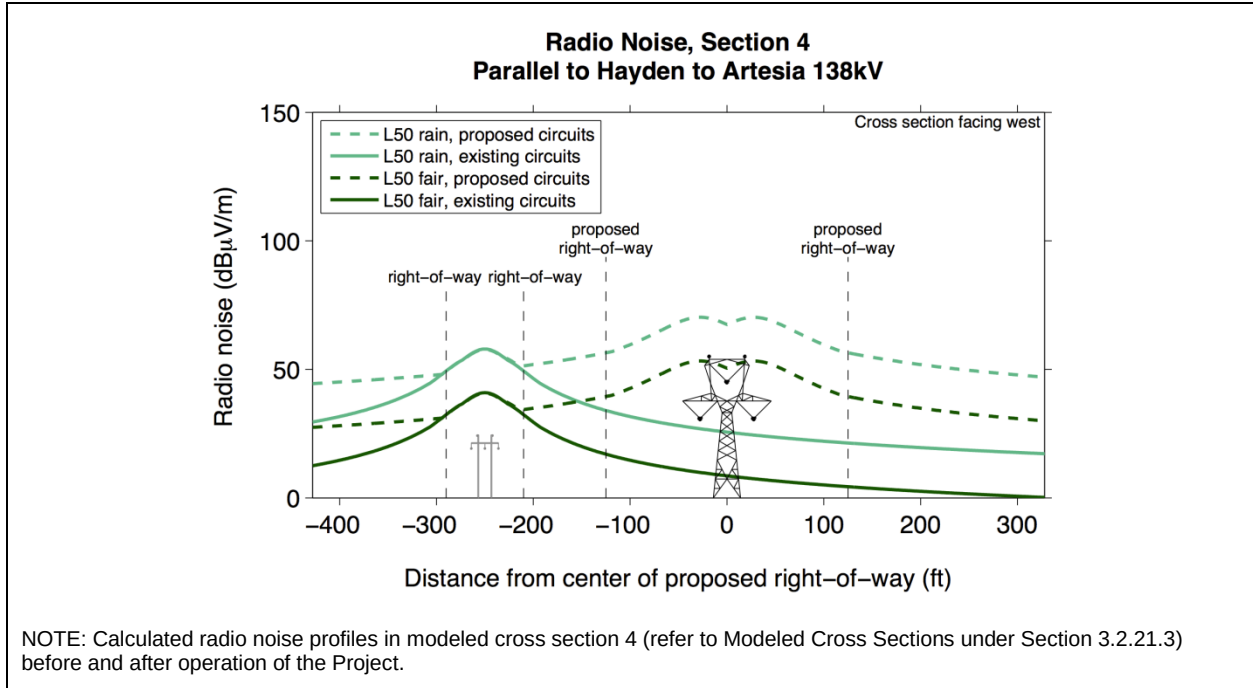


Figure J-16 Calculated Radio Noise in Cross Section 4

J.5 Summary of Calculated Values

TABLE J-1 CALCULATED MAGNETIC FIELD (MILLIGAUSS) FOR AVERAGE-LOAD CONDITIONS, NOMINAL PHASING ¹							
Section	Description	Case ²	Proposed Right-of-way			Existing Right-of-way	
			Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	Negative Right-of-way Edge	Positive Right-of-way Edge
1	Nonparallel condition	Existing	—	—	—	—	—
		Proposed	24.6	131.5	24.6	—	—
2	Parallel to Mona-Bonanza 345kV	Existing	1.2	9.9	9.9	23.7	23.7
		Proposed	25.6	129.3	27.3	26.5	26.9
3	Parallel to Spanish Fork-Carbon 138kV	Existing	0.7	5.3	5.3	25.2	10.3
		Proposed	25.1	130.2	26.7	27.3	12.0
4	Parallel to Hayden-Artesia 138kV	Existing	1.0	1.0	0.1	6.9	6.9
		Proposed	25.0	131.3	24.7	9.6	10.9

NOTES:
¹The “nominal phasing” condition refers to horizontal ABC phasing on all circuits, with the A phase located on the north side of the right-of-way
²The “existing” case refers to the present configuration of transmission lines with average load based on 2012 operational data. The “proposed” case refers to the same load conditions, with all transmission facilities proposed as part of the Project in operation.
kV = Kilovolt

TABLE J-2 CALCULATED MAGNETIC FIELD (MILLIGAUSS) FOR PEAK-LOAD CONDITIONS, NOMINAL PHASING ¹							
Section	Description	Case ²	Proposed Right-of-way			Existing Right-of-way	
			Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	Negative Right-of-way Edge	Positive Right-of-way Edge
1	Non-parallel condition	Existing	–	–	–	–	–
		Proposed	42.0	314.7	42.0	–	–
2	Parallel to Mona-Bonanza 345kV	Existing	1.9	15.7	15.7	37.6	37.6
		Proposed	43.7	311.5	48.3	44.9	42.5
3	Parallel to Spanish Fork-Carbon 138kV	Existing	1.1	8.4	8.4	39.4	20.3
		Proposed	42.9	312.5	46.4	44.4	22.8
4	Parallel to Hayden-Artesia 138kV	Existing	1.1	1.1	0.1	7.8	7.8
		Proposed	42.6	314.4	42.1	12.5	16.9

NOTES:
¹The “nominal phasing” condition refers to horizontal ABC phasing on all circuits, with the A phase located on the north side of the right-of-way
²The “existing” case refers to the present configuration of transmission lines with peak load based on 2012 operational data. The “proposed” case refers to the same load conditions, with all transmission facilities proposed as part of the Project in operation.
kV = Kilovolt

TABLE J-3 CALCULATED RANGE OF MAGNETIC FIELD (MILLIGAUSS) FOR AVERAGE-LOAD CONDITIONS, ALL PHASING ALTERNATIVES¹						
Section	Case ²	Proposed Right-of-way			Existing Right-of-way	
		Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	Negative Right-of-way Edge	Positive Right-of-way Edge
1	Existing	–	–	–	–	–
	Proposed	24.6	131.5	24.6	–	–
2	Existing	1.2	9.9	9.9	23.7	23.7
	Proposed	23.6 to 25.6	129.3 to 133.4	16.7 to 33.0	15.6 to 35.7	20.0 to 26.9
3	Existing	0.4 to 0.7	4.4 to 5.3	4.4 to 5.3	23.7 to 25.2	5.5 to 10.3
	Proposed	24.1 to 25.1	130.2 to 132.9	21.5 to 28.4	20.5 to 32.6	4.5 to 12.1 ³
4	Existing	1.0	1.0	0.1	6.9	6.9
	Proposed	24.0 to 25.3	131.3 to 131.8	24.5 to 24.7	5.9 to 10.9	7.6 to 14.4
NOTES: ¹ Where expressed as a range, reported values indicate the minimum and maximum calculated magnetic field levels over all phase permutations of existing and proposed transmission lines. Where expressed as a single number, the calculated magnetic field levels do not change over phasing alternatives. ² The “existing” case refers to the present configuration of transmission lines with average load based on 2012 operational data. The “proposed” case refers to the same load conditions, with all transmission facilities proposed as part of the Project in operation. ³ For any given phasing of the Spanish Fork-Carbon #1 and #2 transmission lines, the calculated Project-related changes in magnetic field levels at this location are between -1.9 and +2.5 milligauss.						

TABLE J-4
CALCULATED RANGE OF MAGNETIC FIELD (MILLIGAUSS)
FOR PEAK-LOAD CONDITIONS, ALL PHASING ALTERNATIVES¹

Section	Case ²	Proposed Right-of-way			Existing Right-of-way	
		Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	Negative Right-of-way Edge	Positive Right-of-way Edge
1	Existing	–	–	–	–	–
	Proposed	42.0	314.7	42.0	–	–
2	Existing	1.9	15.7	15.7	37.6	37.6
	Proposed	40.5 to 43.7	311.5 to 317.5	27.8 to 54.2	21.8 to 56.8	31.6 to 42.5
3	Existing	0.6 to 1.1	6.5 to 8.4	6.5 to 8.4	36.1 to 39.4	12.6 to 20.3
	Proposed	41.2 to 42.9	312.5 to 317.0	36.4 to 48.5	31.4 to 52.3	10.7 to 23.2 ³
4	Existing	1.1	1.1	0.1	7.8	7.8
	Proposed	41.2 to 42.9	314.4 to 314.9	41.9 to 42.1	7.9 to 14.7	12.7 to 21.1

NOTES:

¹Where expressed as a range, reported values indicate the minimum and maximum calculated magnetic field levels over all phase permutations of existing and proposed transmission lines. Where expressed as a single number, the calculated magnetic field levels do not change over phasing alternatives.

²The “existing” case refers to the present configuration of transmission lines with peak load based on 2012 operational data. The “proposed” case refers to the same load conditions, with all transmission facilities proposed as part of the Project in operation.

³For any given phasing of the Spanish Fork-Carbon #1 and #2 transmission lines, the calculated Project-related changes in magnetic field levels at this location are between -6.0 and +4.9 milligauss.

TABLE J-5
CALCULATED ELECTRIC FIELD (kV/m)
FOR AVERAGE CONDUCTOR SAG, NOMINAL PHASING¹

Section	Description	Case ²	Proposed Right-of-way			Existing Right-of-way	
			Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	Negative Right-of-way Edge	Positive Right-of-way Edge
1	Non-parallel condition	Existing	–	–	–	–	–
		Proposed	0.87	6.09	0.86	–	–
2	Parallel to Mona-Bonanza 345kV	Existing	0.03	0.29	0.29	1.03	1.03
		Proposed	0.87	6.10	0.58	0.72	1.05
3	Parallel to Spanish Fork-Carbon 138kV	Existing	<0.01	0.07	0.07	0.57	0.52
		Proposed	0.87	6.10	0.80	0.36	0.52
4	Parallel to Hayden-Artesia 138kV	Existing	0.06	0.06	<0.01	0.81	0.81
		Proposed	0.80	6.10	0.87	0.83	0.64

NOTES:

¹The “nominal phasing” condition refers to horizontal ABC phasing on all circuits, with the A phase located on the north side of the right-of-way

²The “existing” case refers to the present configuration of transmission lines with nominal midspan conductor heights. The “proposed” case refers to the same conductor heights on existing transmission lines, with design midspan conductor height on the proposed 500kV transmission line (60 degrees Fahrenheit conductor temperature at average load).

kV = Kilovolt

kV/m = kilovolt per meter

TABLE J-6
CALCULATED ELECTRIC FIELD (kV/m)
FOR MAXIMUM CONDUCTOR SAG, NOMINAL PHASING¹

Section	Description	Case ²	Proposed Right-of-way			Existing Right-of-way	
			Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	Negative Right-of-way Edge	Positive Right-of-way Edge
1	Non-parallel condition	Existing	–	–	–	–	–
		Proposed	0.75	9.93	0.75	–	–
2	Parallel to Mona-Bonanza 345kV	Existing	0.03	0.29	0.29	1.03	1.03
		Proposed	0.76	9.93	0.49	0.78	1.04
3	Parallel to Spanish Fork-Carbon 138kV	Existing	<0.01	0.07	0.07	0.57	0.52
		Proposed	0.75	9.93	0.68	0.39	0.52
4	Parallel to Hayden-Artesia 138kV	Existing	0.06	0.06	<0.01	0.81	0.81
		Proposed	0.68	9.93	0.75	0.83	0.67

NOTES:

¹The “nominal phasing” condition refers to horizontal ABC phasing on all circuits, with the A phase located on the north side of the right-of-way

²The “existing” case refers to the present configuration of transmission lines with nominal midspan conductor heights. The “proposed” case refers to the same conductor heights on existing transmission lines, with design midspan conductor height on the proposed 500kV transmission line (239 degrees Fahrenheit conductor temperature at peak load).

kV = Kilovolt

kV/m = kilovolt per meter

TABLE J-7
CALCULATED RANGE OF ELECTRIC FIELD (kV/m)
FOR AVERAGE CONDUCTOR SAG, ALL PHASING ALTERNATIVES¹

Section	Case ²	Proposed Right-of-way			Existing Right-of-way	
		Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	Negative Right-of-way Edge	Positive Right-of-way Edge
1	Existing	–	–	–	–	–
	Proposed	0.87	6.09	0.86	–	–
2	Existing	0.03	0.29	0.29	1.03	1.03
	Proposed	0.85 to 0.88	6.08 to 6.12	0.58 to 1.12	0.72 to 1.32	0.99 to 1.07
3	Existing	<0.01	0.06 to 0.07	0.06 to 0.07	0.55 to 0.57	0.49 to 0.52
	Proposed	0.86 to 0.87	6.09 to 6.10	0.80 to 0.92	0.33 to 0.75	0.45 to 0.55
4	Existing	0.06	0.06	<0.01	0.81	0.81
	Proposed	0.80 to 0.91	6.09 to 6.10	0.86 to 0.87	0.76 to 0.85	0.64 to 0.95

NOTES:

¹Where expressed as a range, reported values indicate the minimum and maximum calculated electric field levels over all phase permutations of existing and proposed transmission lines. Where expressed as a single number, the calculated electric field levels do not change significantly over phasing alternatives.

²The “existing” case refers to the present configuration of transmission lines with nominal midspan conductor heights. The “proposed” case refers to the same conductor heights on existing transmission lines, with design midspan conductor height on the proposed 500kV transmission line (60 degrees Fahrenheit conductor temperature at average load).

kV = Kilovolt

kV/m = kilovolt per meter

TABLE J-8 CALCULATED RANGE OF ELECTRIC FIELD (kV/m) FOR MAXIMUM CONDUCTOR SAG, ALL PHASING ALTERNATIVES¹						
Section	Case ²	Proposed Right-of-way			Existing Right-of-way	
		Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	Negative Right-of-way Edge	Positive Right-of-way Edge
1	Existing	–	–	–	–	–
	Proposed	0.75	9.93	0.75	–	–
2	Existing	0.03	0.29	0.29	1.03	1.03
	Proposed	0.74 to 0.77	9.92 to 9.95	0.49 to 1.01	0.78 to 1.26	0.99 to 1.07
3	Existing	<0.01	0.06 to 0.07	0.06 to 0.07	0.55 to 0.57	0.49 to 0.52
	Proposed	0.75	9.93	0.68 to 0.80	0.36 to 0.73	0.46 to 0.55
4	Existing	0.06	0.06	<0.01	0.81	0.81
	Proposed	0.68 to 0.80	9.93	0.75	0.76 to 0.85	0.66 to 0.93
NOTES: ¹ Where expressed as a range, reported values indicate the minimum and maximum calculated electric field levels over all phase permutations of existing and proposed transmission lines. Where expressed as a single number, the calculated electric field levels do not change significantly over phasing alternatives. ² The “existing” case refers to the present configuration of transmission lines with nominal midspan conductor heights. The “proposed” case refers to the same conductor heights on existing transmission lines, with design midspan conductor height on the proposed 500kV transmission line (239 degrees Fahrenheit conductor temperature at peak load). kV = Kilovolt kV/m = kilovolt per meter						

TABLE J-9 CALCULATED AUDIBLE NOISE (dBA), L ₅₀ FOUL WEATHER ¹							
Section	Description	Case ²	Proposed Right-of-way			Existing Right-of-way	
			Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	Negative Right-of-way Edge	Positive Right-of-way Edge
1	Non-parallel condition	Existing	–	–	–	–	–
		Proposed	48.9	53.1	48.9	–	–
2	Parallel to Mona-Bonanza 345kV	Existing	38.3	43.6	43.6	45.8	45.8
		Proposed	49.3	53.3	50.1	49.7	48.2
3	Parallel to Spanish Fork-Carbon 138kV	Existing	33.1	36.9	36.9	39.0	43.5
		Proposed	49.0	53.2	49.2	47.5	46.5
4	Parallel to Hayden-Artesia 138kV	Existing	27.9	27.9	22.5	32.8	32.8
		Proposed	49.0	53.1	48.9	45.3	46.7
NOTES: ¹ Calculated audible noise levels are the same for all phasing alternatives ² The “existing” case refers to the present configuration of transmission lines with nominal midspan conductor heights. The “proposed” case refers to the same conductor heights on existing transmission lines, with design midspan conductor height on the proposed 500kV transmission line (60 degrees Fahrenheit conductor temperature at average load). dBA = Decibel (A-weighted) kV = Kilovolt L ₅₀ = Median sound level							

TABLE J-10 CALCULATED RADIO NOISE (dBμV/m), L ₅₀ FAIR WEATHER ¹				
Section	Description	Case ²	Location ³	
			Minus 100 Feet Beyond Outer Conductor	Plus 100 Feet Beyond Outer Conductor
1	Non-parallel condition	Existing	—	—
		Proposed	39.2	39.2
2	Parallel to Mona-Bonanza 345kV	Existing	20.5	33.0
		Proposed	39.1	32.8
3	Parallel to Spanish Fork-Carbon 138kV	Existing	17.2	33.5
		Proposed	39.2	33.4
5	Parallel to Hayden-Artesia 138kV	Existing	18.2	4.3
		Proposed	29.0	39.2

NOTES:

¹Calculated radio noise levels are the same for all phasing alternatives

²The “existing” case refers to the present configuration of transmission lines with nominal midspan conductor heights. The “proposed” case refers to the same conductor heights on existing transmission lines, with design midspan conductor height on the proposed 500kV transmission line (60 degrees Fahrenheit conductor temperature at average load).

³The outer conductor is selected across the entire transmission corridor, which may consist of more than one parallel right-of-way. Where the Project runs parallel to existing transmission lines, one outermost conductor belongs to a circuit adjacent to the Project.

dBμV/m = Decibels above 1 microvolt per meter

kV = Kilovolt

L₅₀ = Median radio noise level

APPENDIX K – BUREAU OF LAND MANAGEMENT MITIGATION GUIDANCE

Mitigation

The Bureau of Land Management (BLM) may require mitigation measures and conservation actions to achieve land-use plan goals and objectives and provide for sustained yield of natural resources on public lands, while continuing to honor the agency's multiple-use missions. The sequence of mitigation action would be the mitigation hierarchy (avoid, minimize, rectify, reduce or eliminate over time, compensate) as identified by the White House Council on Environmental Quality (40 Code of Federal Regulations 1508.20) and BLM's *Draft - Regional Mitigation Manual* Section 1794. Certain alternatives also may identify compensatory mitigation requirements for those implementation level activities whose impacts the agency(s) cannot adequately avoid, minimize, rectify, reduce, or eliminate over time (i.e., residual impacts).

The priority is to mitigate impacts at the site of the activity in conformance with the land-use plan goals and objectives through impact avoidance, minimization, rectification, and reduction over time of the impact, including those measures described in laws, regulations, policies, and land-use plans. When these types of mitigation measures are not sufficient to ameliorate anticipated direct, indirect, and cumulative impacts and substantial or significant residual impacts remain, additional measures to reduce these residual impacts to meet applicable land-use plan goals and objectives would be required (compensatory mitigation).

The Project would apply the mitigation hierarchy and would identify or incorporate by reference applicable land-use plan mitigation measures for:

- **Avoiding**
 - Identification of avoidance areas and/or measures (e.g., right-of-way avoidance areas, no surface occupancy areas) already included in laws, regulations, and/or governmental decision documents (e.g., BLM resource management plans [RMPs], state, tribal, or county plans that govern site or permit authorizations)
 - Identification of additional avoidance measures for the BLM to consider (e.g., additional avoidance best management practices)
- **Minimizing**
 - Identification of minimization measures (e.g., surface-use controls, conservation measures, best management practices) already included in BLM decision documents (e.g., RMPs; U. S. Fish and Wildlife Service Biological Opinions, other Project decision documents and right-of-way authorizations)
 - Identification of additional minimization measures for the BLM to consider (e.g., Applicant-committed design features)
- **Rectifying**
 - Identification of measures for the BLM to consider, including repairing, rehabilitating, or restoring affected landscapes
- **Reducing or eliminating**
 - Identification of measures for the BLM to consider for reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
- **Compensating**
 - Identification of measures for the BLM to consider for compensating for the impact by replacing or providing substitute resources or environments

When applying mitigation at any level of the mitigation hierarchy, there would be requirements for monitoring the effectiveness of the mitigation as well as the durability of the mitigation. This monitoring is necessary, especially in relation to durability for compensatory mitigation to identify when it may be appropriate to consider applying adaptive management concepts to ensure continued durability for the life of the Project.

Two important concepts related to durability are (1) ecological durability, the length of time the benefits from mitigation measures persist on and influence the landscape and meet or exceed the length of time that projected impacts would affect resources and (2) protective durability, ecological values in compensatory mitigation Project areas that are unaffected by future and conflicting land-uses or disturbances.

The ecological durability of compensatory mitigation is greatest if the projects are large enough or properly located so they would, either in themselves or in conjunction with other projects, adjacent landscape conditions, or climate change predictions, provide the targeted conservation benefits.

Ecological durability may be compromised when the benefits of compensatory mitigation do not persist for the full duration of the impact intended to be offset (i.e., from initial surface disturbance to final reclamation, rehabilitation, or restoration). Damage to functioning compensatory mitigation measures may be caused by natural disturbances (such as wildfire) or anthropogenic disturbances (such as other authorized development), which shorten the intended duration of applicable mitigation.

The BLM would require that mitigation measures have a degree of protective durability. Financial protections (e.g., bonding for construction, endowment for mitigation management) are an important tool to achieve protective durability. The BLM would expressly condition its approval of the Project on the Applicant's commitment to perform or cover the costs of mitigation, both onsite and outside the area of impact.

Examples of compensatory mitigation include creation or restoration of wetlands; offsite vegetation treatments to improve sage-grouse or migratory bird habitat; purchase of property or conservation easements to provide long-term protection for sage-grouse or migratory bird habitats; or appropriate mitigation for impacts to designated National Scenic and/or Historic Trails or those trails recommended as suitable for congressional designation.